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HUMAN RESOURCES

METHODOLOGY FOR GENERATING EFFICIENCY
AND EFFECTIVENESS MEASURES (MGEEM): A GUIDE
FOR AIR FORCE MEASUREMENT FACILITATORS

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The objective of this guide is to provide sufficient technical detail about the Methodology for Generating Efficiency and Effectiveness Measures (MGEEM) so that a measurement facilitator can use the procedure to create a complete productivity measurement system for any target organization.

The guide contains four chapters and an appendix. Chapter 1 provides a framework for understanding organizations as systems, defined in terms of their inputs, outputs, goals, and interactions with their environments across system boundaries to accomplish goals. Within the systems framework, productivity is defined as a combination of efficiency (the ratio of inputs to outputs) and effectiveness (the extent to which the outputs satisfy mission objectives). Chapter 2 lays a foundation upon which the MGEEM process can begin, including identifying requisite skills of the facilitator, organizational familiarization, and planning the measurement activity. Chapter 3 explains the selection and use of measurement development teams to identify the organization's principal intended accomplishments, called Key Result Areas (KRAs), indicators of each KRA, and data sources for each indicator. Chapter 4 discusses procedures for using the productivity measures which

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result from application of the MGEEM as a tool for improving organizational productivity. Advantages of the MGEEM to commanders include (a) identifying key objectives of the organization, (b) providing measures for each objective (including measures of overall as well as components of organizational productivity), (c) identifying priorities for increasing productivity, (d) assisting in allocating resources, (e) identifying problems before they become serious, and (f) showing when problems are fixed. Advantages to workers include (a) having an acceptable productivity measurement system since they have an input to its development, (b) knowing what is expected, (c) showing current status, (d) showing results of efforts (feedback), and (e) providing a basis for goal setting and incentives. The Appendix provides a series of aids to the facilitator including suggested briefing slides, Measurement Implementation Plan format, KRA and indicator development worksheets, samples of KRAs and indicators, and an indicator development quiz.

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METHODOLOGY FOR GENERATING EFFICIENCY AND EFFECTIVENESS
MEASURES (MGEEM): A GUIDE FOR AIR FORCE MEASUREMENT FACILITATORS

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SUMMARY

This guide provides sufficient background and technical information to enable a measurement facilitator to use the Methodology for Generating Efficiency and Effectiveness Measures (MGEEM) to create a complete productivity measurement system for any organization. Requisite background information includes knowledge of the systems concept so that the organization for which the MGEEM is to be applied can be meaningfully defined in terms of its inputs, outputs, goals, and interactions with its environment. According to the systems concept, productivity has two components: (a) efficiency, the quantity of inputs required to produce a given level of outputs and (b) effectiveness, the extent to which these outputs conform to mission requirements.

After becoming familiar with a target organization and defining it as a system, a measurement facilitator develops a plan for implementing the MGEEM which includes a strategy for strengthening "forces for" and minimizing "forces against" the measurement process. Within the context of the implementation plan, the facilitator begins Phase One of the MGEEM process by convening a meeting of the commander (manager or supervisor) and his/her immediate subordinates. This group is posed with the question "What does the Air Force pay this organization to do?" Consensus on the answers, called Key Result Areas (KRAs), is developed through a structured group process. Phase Two involves a meeting with the commander's subordinates and selected members of their subordinates. For each KRA, the facilitator asks what the commander needs to know to determine how well the organization is doing on this aspect of the organization's productivity. Consensus on the answers, called indicators, is again developed through a structured group process. Examples of KRAs and indicators are (a) for a repair shop, quality of repair and quality control inspections passed; (b) for personnel, timely and effective staffing of positions and percentage of positions filled; and (c) for engineering, customer support and percentage of work orders accomplished. In Phase Three of the MGEEM process, computerized indicator data are periodically reported to workers and managers according to the principles of feedback, goal setting, and incentives. These principles have to do with issues such as the frequency and objectivity of feedback; the acceptability, difficulty, and feasibility of goals; and the connection between effort, performance, and reward. Suggestions are made to overcome barriers to successful implementation.

This is one of two final technical papers from Task 13, Technology Transfer Plan and User Manuals for the Methodology for Generating Efficiency and Effectiveness Measures (MGEEM), for Contract No. F33615-83-C-0030, Contributive Research in Manpower and Personnel Technologies. The other technical paper is AFHRL-TP-86-26, Methodology for Generating Efficiency and Effectiveness Measures (MGEEM): A Guide for Commanders, Managers, and Supervisors. Both technical papers are user manuals for the MGEEM. The conceptualization and field test of the MGEEM are documented in AFHRL-TR-81-9, Productivity Measurement Methods: Classification, Critique, and Implications for the Air Force, and AFHRL-TP-84-54, Field Test of the Methodology for Generating Efficiency and Effectiveness Measures.

TABLE OF CONTENTS

Table of Contents (Continued)

Table of Contents (Concluded)

LIST OF FIGURES

LIST OF TABLES

METHODOLOGY FOR GENERATING EFFICIENCY
AND EFFECTIVENESS MEASURES (MGEEM):
A GUIDE FOR AIR FORCE MEASUREMENT FACILITATORS

1. PRODUCTIVITY IN AIR FORCE ORGANIZATIONS

1.1 What is Productivity?

What does productivity mean? Manpower cuts? More for less? Peacetime efficiency at the expense of wartime readiness? Or could it mean quality products and services, improved military preparedness for the tax dollar spent, more effective organization, higher utilization rates for equipment, higher reenlistment rates, and a reduction of maintenance costs per sortie?

To military commanders, productivity may have any or all of these connotations. For most commanders, productivity has various meanings, depending on their position, background, and management philosophy. However, for the Air Force as a whole, there is little doubt that the concept of productivity and the need for productivity improvement will exist for the foreseeable future. As long as there are multiple threats to the nation's security and limited resources to deal with these threats, the military faces the problem of how to obtain the best defense for the available dollars and manpower. This is what productivity is all about.

As a measurement facilitator, you are most likely to work with units at the wing level and below. Therefore, you need to think about what productivity means at these organizational levels. Before discussing the meaning of productivity, we need to introduce some ideas about organizations as systems. This will already be familiar to many Air Force managers and management consultants, but it is essential to an understanding of the Methodology for Generating Efficiency and Effectiveness Measures (MGEEM).

1.2 Basic System Concepts

A system is a set of interrelated components that have a common purpose or goal. An Air Force organizational system could be a wing, a squadron, or even a small work team within a squadron. Systems can be small or large. However, they all have a set of interrelated components, such as people, materials, equipment, and organizational entities, which share a common mission.

Systems are defined in terms of their inputs, outputs, goals, and interactions with their environment across system boundaries. Let us examine these concepts for a military organization, a communications-navigation (comm-nav) branch in an avionics squadron. This branch performs maintenance on the on-board communications and navigation equipment carried by aircraft in the wing.

1.2.1 Inputs

As a general rule, inputs to a maintenance organization can be grouped according to the categories in Table 1.

Table 1. Categories of Inputs

Labor - Number of hours worked

Material - Number of pieces, number of units, dollar value, etc.

Capital - Number of dollars invested, depreciated value of assets, etc.

Energy - Number of kilowatt hours used, number of gallons of fuel, etc.

For the comm-nav branch, labor inputs consist of the total number of assigned personnel multiplied by the number of duty hours in the period under consideration (e.g., week, month). In certain cases, it may be desirable to adjust the total labor input for such factors as personnel on temporary duty (TDY), on detail to other units, on leave, etc. to arrive at the total number of available hours. Although definitions must be explicitly agreed upon, labor input is typically defined in terms of the number of hours spent by designated personnel during a given time period. In most military organizations, the most significant input is labor.

A second input category for the comm-nav branch is material. In order to perform its mission, personnel must be supplied with spare parts, expendable items (e.g., non-capitalized tools and equipment), office supplies, etc. Quantifying material inputs presents a number of measurement problems because the categories of measurement vary from item to item. For example, if we were concerned with wire, we would probably quantify it in terms of feet. If we were concerned with pencils, we would count the number of pencils or number of dozens. For avionics components, we would count the number of items. Obviously, we cannot aggregate or add "apples and oranges" unless they are converted to a common scale of measurement. Typically, the common scale for material is dollars. Depending on the accounting practices of the unit, item values can be expressed in terms of initial cost or in terms of replacement cost.

A third category of inputs is capital. At the branch level, there is usually very little knowledge of capital investment program opportunities or the process by which assets are capitalized. However, the unit of measurement for capital assets, such as buildings and major pieces of test equipment, is units or dollars of depreciation. In wing or higher level organizations, capital may have more importance. Refer to Air Force Regulation (AFR) 25-3, Air Force Productivity Enhancement Program (PEP) for a description of Air Force capital investment programs.

A fourth category of inputs is usually called energy. This category includes the electricity to operate the facility, the fuel to power vehicles or aircraft, and gas or oil for heating. In the case of the comm-nav branch, energy is not a significant input. Perhaps the branch owns vehicles and can affect the gallons of fuel used. It can also affect the amount of energy used to heat its facilities. However, energy matters are typically handled by a centralized resource management agency. When a single energy type is considered, it is preferable to quantify it in terms of physical units such as gallons, kilowatt hours, or British thermal units. However, if aggregation is an issue, units must be converted to dollars.

1.2.2 Outputs

A second major systems concept is outputs. An output is a product or service that a system produces to achieve its purpose. In the comm-nav example, outputs are pieces of equipment repaired, personnel trained, reports submitted to squadron headquarters, etc. Whatever the

organization produces for use outside its own organizational boundaries is an output. A distinction is frequently made between "intermediate" outputs and "final" outputs. Intermediate outputs are consumed by the organization itself or are necessary for use by the organization to produce final outputs. Final outputs are exported across the organization's boundaries to other organizational systems.

1.2.3 System Boundary

The boundary of a system separates it from its environment. Although the concept of boundary is "theoretical," it has practical implications. However, defining a system in terms of what it includes is not always easy. For instance, in defining the comm-nav branch as a system, where do you draw the line? Is an individual who is on detail to the squadron for 2 months within the system? Are the vehicles on permanent loan to the branch from the motor pool part of the comm-nav system or the motor pool system? Questions such as these must be answered to unambiguously define the system under investigation. Once such questions are answered, the system's boundaries can be drawn. However, it should be clear from these examples that boundary issues deal with both space (e.g., area occupied by system components), and time (e.g., the length of time someone is away from the organization before that person is considered no longer within the system).

1.2.4 Environment

Once a system is defined by specifying its boundaries, its environment must also be defined. Anything that is not part of the system is part of its environment. Systems survive through transactions with their environment. Personnel resources, supplies and equipment, and energy to operate the system flow from the environment. Relevant organizations in the environment of the comm-nav branch include the maintenance directorate, avionics squadron headquarters, other branches in the avionics squadron, supply organizations, and flight operations (since many of the branch's mission goals flow from equipment writeups made by flight crews). Maintaining effective boundary relationships is a critical aspect of a system's operation.

1.2.5 System Diagram

These basic system concepts may be depicted in the form of a diagram, as shown in Figure 1.
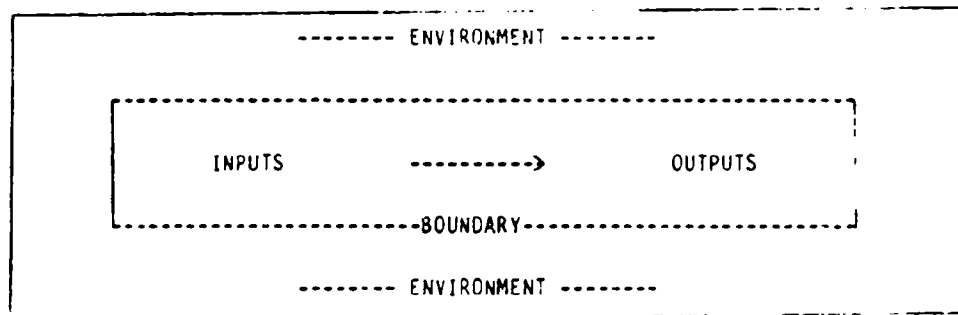
Figure 1. System Diagram.

As Figure 1 shows, a system is defined by its boundary, which separates it from its environment. In an open system, such as an organizational system, inputs are derived from the environment. The system uses these inputs to produce outputs which are exchanged with the

environment. As this very simple analysis suggests, an organizational system must manage the process of converting inputs to outputs, but must also manage its boundary relationships to assure a continuing flow of inputs. In most organizational systems, the flow of inputs is dependent on the extent to which system outputs conform to the requirements of the environment (e.g., customers) with respect to quantity, quality, price/cost, etc.

1.3 Productivity - A Systems Concept

Now that we have discussed the basic components of an organizational system, we are in a position to define productivity. As applied to Air Force organizations, productivity has two components: efficiency and effectiveness. Efficiency is concerned with the quantity of inputs required to produce a given level of outputs. Effectiveness refers to the extent to which the outputs conform to mission requirements. These definitions are expressed in AFR 25-3, which defines productivity as:

> ...the measure of an organization's performance. It's not only "efficiency" (the ratio of inputs to outputs), but also "effectiveness" (to what extent the output satisfies mission objectives) (AFR 25-3, 1982, p. 2).

2. LAYING THE FOUNDATION

2.1 Selecting a Measurement Facilitator

The MGEEM process is conducted by a measurement facilitator who is usually someone external to the organization, although not necessarily so. The measurement facilitator should possess a working knowledge of and demonstrated skill in group facilitation (e.g., conducting meetings, facilitating group discussion, interviewing, bringing about consensus, and listening). Although specific facilitation skills unique to the MGEEM are covered in this manual, no attempt is made to provide a full treatment of the range of skills required. Measurement facilitators lacking group facilitation experience should obtain guidance from a "process" coach. In Air Force organizations, such coaches might be quality circles facilitators or human relations trainers, or persons working in headquarters consulting organizations. In addition, the facilitator should understand the basics of organizational performance measurement. AFR 25-3 is a helpful guide in this respect, especially its General Information and Glossary sections.

2.2 Organizational Familiarization

Once selected, the measurement facilitator must become familiar with the target organization. This can be accomplished through (a) discussions with the commander (manager or supervisor), (b) a review of existing in-house documentation, and (c) a tour of the organization's facilities and work sites.

2.2.1 Discussions with the Commander

An initial meeting with the target unit's commander marks the formal beginning of the MGEEM process. If the commander has initiated the process and selected the measurement facilitator, then this meeting should focus on the commander's purpose in initiating the measurement activity and on helping the measurement facilitator become familiar with the organization. However, in the event that the commander has been directed by higher headquarters to begin the measurement process - not the ideal situation - the initial meeting will be of a different nature. In that

case, the measurement facilitator should devote considerable time and attention to establishing rapport with the commander to assure him/her that the purpose of the MGEEM process is to develop a measurement tool that will improve the management of the unit.

Based on the assumption that the commander is voluntarily engaging in the MGEEM process, the facilitator can use the structured interview form in Appendix A to assist in the initial meeting. In this meeting, it is likely that the commander will expect to receive an overview briefing on the MGEEM implementation process. Therefore, the facilitator should be prepared to discuss the major steps in the process and provide a timetable for their implementation. The implementation planning process is discussed in Section 2.3.3.

2.2.2 Review of Existing In-House Documentation

In most Air Force functional areas, the measurement facilitator can become sufficiently familiar with the target organization and its functions by reviewing written material relative to the organization. Examples of documentation that can be included in this review are:

1. Work center descriptions;

2. Task inventories containing detailed task listings of the Air Force Specialty Codes involved;

3. Organization and work center organizational charts;

4. Manpower studies conducted for the organization or for the functional specialty;

5. Regulations/directives and other official documents that govern the work of the target organization;

6. Commander's briefing packages used to give visitors an overview of the organization.

2.2.3 Site Visit

Another source of information about the target organization is a site visit. Prior to conducting such a visit, the facilitator and commander should decide how the facilitator is to be introduced to unit personnel. If the visit is to be conducted prior to the implementation of the measurement communications plan, then the facilitator should be introduced as a visitor. If unit personnel have been fully informed about the purpose and events associated with the MGEEM implementation process, the facilitator should be identified as being associated with the process. The issue is that the facilitator's visit through the organization is not the appropriate time to communicate to unit personnel what the measurement process is about.

During the site visit, the facilitator's primary concern is to develop a visual picture and to "learn the language" of the target organization. The facilitator should focus on identifying the unit's major products and services and developing a general understanding of the work flow involved. Although it is possible for the facilitator to do an adequate job of conducting the MGEEM process without having seen the work site, there are advantages to such a visit. One advantage is the opportunity to establish rapport with members of the organization. If the facilitator cares enough to see how the organization works, members will tend to accord him/her greater respect. Another advantage is that through seeing the work site, the facilitator will communicate more effectively in the group sessions to follow. The facilitator will better understand participants' comments without needing to seek clarification.

5

2.2.4 Organizational Diagram

The facilitator should depict the results of the organizational familiarization process in the form of an organizational diagram. In essence, this is the systems diagram shown in Figure 1 loaded with characteristics of the specific target organization. A resulting sample organizational diagram for a base administration division is shown in Figure 2.

2.3 Planning the Measurement Process

2.3.1 Defining Goals of the Measurement Activity

The first step in developing a measurement plan involves working with the commander to define the goals of the productivity measurement process. There are many reasons why organizations decide to generate measures of their productivity. In general, these motives may be grouped under (a) organizational control and (b) organizational improvement. The motive of organizational control is that organizations want to generate measures to satisfy the needs of someone else (e.g., higher headquarters or a control agency, such as manpower or budget). The motive of measurement for organizational improvement has a different focus, in that the commanders themselves wish to create measures as guides to take corrective action to improve organizational performance. Thus, control-oriented measurement is used by organizations to justify themselves to organizations in their environments. Improvement-oriented measurement provides information to enable organizations to better manage themselves. Control-oriented measurement is commonplace in the Air Force, but improvement-oriented measurement occurs less frequently. Since the MGEEM is primarily an improvement-oriented approach, this distinction needs to be recognized.

A basic purpose of developing improvement-oriented measurement is that it provides an organization with a considerable degree of self-control. Therefore, the relevant measures are not those which fall under the control of external agencies. For the purposes of MGEEM, the most relevant measures are those that are controllable from the point of view of the unit commander.

Measurement should help the commander periodically identify and track those aspects of efficiency and effectiveness over which he/she has control. Through measurement, the unit can assess its current performance and take corrective action as required. The facilitator should work with the commander to promote improvement orientation as the purpose of measurement. Measures being so developed are for the unit itself, not for some outside control agency or higher headquarters.

2.3.2 Identifying Forces For and Against Success of the Measurement Activity

At this stage of the process, the facilitator should work with the commander to identify the driving and restraining forces associated with implementation of the MGEEM process. Identification of these forces can be portrayed as a diagram (Figure 3). At the discretion of the unit commander, it may be helpful to involve other managers, supervisors, and individual workers in this effort.

2.3.3 Developing an Implementation Plan

Once the "forces for and against" analysis has been completed, the result should serve to guide the development of an implementation plan. The strategy to follow in developing an implementation plan is to consider options for maximizing or strengthening the forces for and

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Technical Assistance Given
Special Orders Prepared
Detail Requests Filled
Freedom of Inf. Req. Handled
Customer Requests Filled

Inputs

Labor
Equipment
Materials
Time

22 AF   62 MAW   TENANT UNITS   62 AB Gp   Hq MAC

External Interactions

Demand

Regulations
Customer Needs
Higher Headquarters
Extra Duties

Figure 2. Organization Diagram - Administration Division.

7

minimizing the forces against successful implementation. A diagram such as that shown in Figure 3 can guide this process.

For example, consider the first item under Forces For in Figure 3, "Commander Support." Commander Support is a force for MGEEM implementation, but only if it is communicated clearly and strongly to all members of the organization. Therefore, an important step in the implementation plan is to communicate the support of the commander to organization members. A similar process can be carried out for other Forces For items.

Goal - Successful Implementation of MGEEM

Forces for		Forces against
Commander Support ------------>	<------------	Fear of More Paperwork
Desire to Improve ------------>	<------------	Heavy Workload
Noncommissioned Officer (NCO) Support ------------>	<------------	Fear of Personnel Loss
Personnel Desire ------------> to Have a Voice	<------------	Lack of Understanding of Productivity
	<------------	Fear of Loss of Freedom

Figure 3. Analysis of Forces For and Forces Against Successful Implementation of MGEEM.

Forces Against can be addressed in the implementation plan by (a) acknowledging them, (b) reducing them, (c) showing that there is no substantial reason for concern, or (d) removing the reason for the fear. For example, Fear of More Paperwork might be removed or reduced by a notation in the implementation plan of the need to acquire a personal computer, or Fear of Loss of Freedom might be addressed in the orientation process prior to measurement development. A sample implementation plan format is presented in Appendix B.

2.4 Communicating the Implementation Plan

After the measurement plan is developed, it should be communicated over a short period of time to all members of the organization from the top down. Communication should be in the form of both face-to-face and written communication. The sequence of communication activities for a branch might be as follows.

Monday, 0800, Branch Chief's Staff Meeting. The branch chief introduces the facilitator and discusses the purpose of the MGEEM measurement activity within the branch. The facilitator discusses the steps involved in implementation and proposes a timetable. Section chiefs are asked for comments, and schedule conflicts are resolved. The branch and section chiefs agree on the appropriate time for the facilitator to visit the various sections to present the measurement plan.

Monday, 0900, Facilitator and Branch Chief Finalize Memorandum. A memorandum is prepared for later distribution to personnel, summarizing the highlights of the implementation schedule. The

8

memorandum should focus on the purpose of the measurement activity, the schedule, and how members of the organization will be affected.

Monday, 1300 - 1400, Workplace Meetings. The facilitator and branch chief go to each section and hold 10- to 15-minute meetings with section members. During these meetings, members hear the branch and section chiefs express support for the MGEEM measurement process. Members hear from the facilitator a general outline of the steps involved in implementation and what will be expected from each member of the organization. Each member of the section receives a copy of the previously developed memorandum, which summarizes the information presented. Members' questions are answered.

2.5 Pitfalls to Avoid

At this stage of the process, there are some major rules-of-thumb to observe in order to avoid some common pitfalls:

1. Avoid the perception that the measurement effort is being forced on the organization and does not have the support of branch and/or section chiefs. The main purpose of the communications effort is to prevent such misperceptions. Visible, sincere management support is essential to the success of the MGEEM process.

2. Avoid the perception that the process is designed to "tighten the screws" on members of the organization. Improvement, not control, should be the focus. All communications should focus on these points: We (members of the organization) are doing this for our own benefit, to give us a score card on our performance, to provide a sense of accomplishment, to give us feedback, and to help us identify areas where we can improve performance in the sense of working more efficiently, not necessarily harder.

3. Recognize in the planning process the legitimate organizational barriers to implementation of the measurement effort. For instance, it is a mistake not to recogni e expected strains on resources, such as large numbers of people on TDY and on exercise, or to fail to pay enough attention to the fears of organization members. Implementation must include a sincere effort to give people a chance to voice their fears and concerns and have those concerns answered honestly. However, implementation should not be allowed to drag on until each minor issue is resolved.

4. Ensure that the target organization has been clearly defined. To avoid misunderstandings, the facilitator must have a clear conception, displayed in an organization diagram, of what organizational units and functions are within and beyond the scope of the measurement activity. This understanding must be shared with and agreed to by the commander and management of the target organization.

3. DECIDING WHAT TO MEASURE IN AIR FORCE ORGANIZATIONS

3.1 Productivity in Air Force Organizations

One of the facilitator's primary responsibilities is to help the commander of the target organization communicate the philosophy of productivity improvement to organizational members. This requires two sets of competencies. First, the facilitator must have an understanding of the meaning of productivity improvement as it relates to other aspects of an organization's functioning. Second, the facilitator must be able to communicate this understanding meaningfully to commanders, officers, enlisted personnel, and civilian employees. The facilitator must

understand and communicate the meaning of productivity to these members whether they be in operational units (e.g., fighter squadrons, jet engine maintenance branches, and military airlift wings) or in support units (e.g., administration divisions, weather detachments, and base contracting offices). This section provides the basic concepts of productivity for the facilitator and suggests a means of communicating these ideas to target organization members.

Air Force Regulation 25-3. AFR 25-3 contains useful information for the facilitator on the application of productivity concepts in the Air Force environment. Of particular use in the MGEEM process are the General Information and Glossary sections.

Productivity and Readiness. One commonly held notion among Air Force commanders is that the concept of productivity implies achieving peacetime resource savings at the expense of wartime readiness. This issue is addressed in AFR 25-3, which notes that productivity enhancement focuses on functions that are essentially the same in peacetime and wartime (e.g., launching and recovering aircraft, repairing components, delivering fuel, and procuring and distributing supplies).

Discovering and implementing improved ways of performing these peacetime functions will both enhance their effectiveness in wartime and free resources for use in improving readiness in other areas. (AFR 25-3, 1982, p. 2).

Wing commanders involved in a field test of the MGEEM (Tuttle, Wilkinson, & Matthews, 1985) observed that in the Air Force, resource constraints are a way of life, whether in peacetime or wartime. Therefore, commanders at all levels must be concerned with efficiency as well as effectiveness. In discussing productivity and readiness, however, the issue is not one of tradeoffs between the two. The issue is assuring the maximum level of readiness for a given level of resources. Stated in this manner, improved productivity is clearly consistent with improved levels of readiness.

Productivity and Morale. There is often a tendency to think that productivity improvement is obtained at the expense of morale. Experience suggests that while this tradeoff sometimes occurs, it is more frequently the case that organizations which perform well also have high morale. High performance, high productivity, and high morale are complementary, not competing, aspects of organizational performance. The key to this linkage lies in the following assumptions about people in organizations:

1. Most people want to do a good job.

2. Most people want to feel that they are a part of an organization that is worthwhile and is accomplishing something.

3. Most people have needs for security, self-esteem, social acceptance, recognition, etc., which they attempt to satisfy in part through their work lives.

4. There is an overlapping relationship between organizational and individual goals.

5. Leadership and management provide the linkage between the satisfaction of individual and organizational goals.

Thus, a well-managed organization pays attention to the needs of both the individual and the organization. Such organizations generally have high productivity and high morale. Organizations that are geared only toward the goals of the organization may show high productivity for the short term, but morale will invariably be low. Eventually, this form of

management leads to low productivity, unless managers have a high degree of coercive power over the members of the organization.

Productivity in Different Organizational Environments: A Frame of Reference. The systems view of organizations presented in Chapter 1 provides a framework for analyzing productivity in Air Force organizations. This framework can be expanded to consider the relative importance of efficiency and effectiveness in different types of Air Force organizations.

For this purpose, there are three types of systems: (a) direct outcome, (b) indirect outcome, and (c) unknown outcome. In a direct outcome system, depicted in Figure 4, output virtually assures outcome. Although there is some choice about the form, design, or means of presenting output, the range of output variability is relatively low. Examples of direct outcome systems in the Air Force include dining halls, reprographics shops, mail handling operations, supply rooms, and maintenance organizations. In such systems, the consistency of outputs virtually assures that the desired outcomes will occur. As a result, the major considerations on the part of the producing system are efficiency and quality. Such organizations are concerned with efficiency because they must use resources skillfully in order to produce a sufficient quantity of outputs in the appropriate time period. They are concerned with quality because a principal outcome, customer satisfaction, is directly related to the extent to which output corresponds to customer requirements. In this type of system, effectiveness (i.e., choice of the appropriate output to accomplish the mission) is less of a concern because it is less controllable by the organization.

Input   ------->   Output   ------->   Outcome
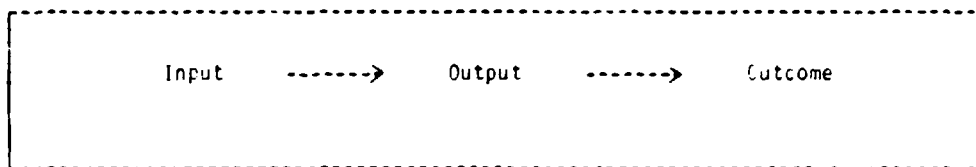
Figure 4. Direct Outcome System.

Figure 5 depicts an indirect outcome system, in which the range of variability of outputs is greater. The system must choose from among a range of possible outputs those which will produce the most favorable outcomes. Only after outputs are clearly specified should the system focus on improving the efficiency with which outputs are produced. The first concern of such an indirect outcome system is whether chosen outputs are the correct ones. Examples of such systems in the Air Force are weather detachments, administration communication branches, inspector general teams, management engineering teams, and military airlift squadrons. In each of these organizations, the commander chooses from a broad range of possible outputs those which are most appropriate in terms of mission accomplishment. Effectiveness, the extent to which the outputs lead to desired outcomes, is a major criterion of organizational performance. Efficiency is also important, but only after the organization has determined that it is producing the "right" outputs.

Input   ------->   Output   ------->   Outcome
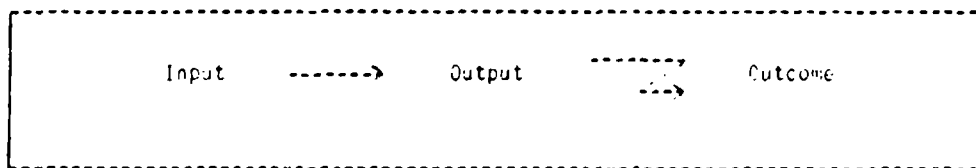
Figure 5. Indirect Outcome System.

11

Figure 6 presents a third type of system, the unknown outcome system. Many combat organizations are in this category. An unknown outcome system is one that prepares to perform its mission but hopefully never is called on to actually do what it prepares to do.

```
.--------------------------------------------------------------------.
|                                                                    |
|                           ---------.             --------.         |
|  Input    ----->    Output   .       Surrogate       ---.   Outcome |
|                           .-->       Outcome                        |
|                                                                    |
|                                                                    |
'--------------------------------------------------------------------'
```
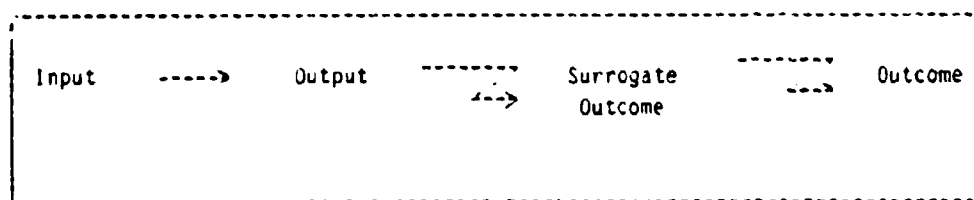
Figure 6. **Unknown Outcome System.**

Air Force organizations which are unknown outcome systems include tactical fighter squadrons, bomber squadrons, and even flying training squadrons that teach combat maneuvers. Primary flight training and instrument flight training organizations are indirect outcome systems since students have the opportunity to determine if the outcomes are achieved (e.g., basic flight maneuvers and sorties under instrument flight rules). In an unknown outcome system, effectiveness, measured using surrogate outcomes (e.g., simulated battle conditions), and innovation are more relevant criteria than efficiency. Too often productivity has been presented in ways that suggest an attempt to convert unknown outcome systems into direct outcome systems. Clearly, the relevant criteria must differ as a function of the type of system under study.

An important conclusion from this discussion is that the facilitator must understand which of the three types of systems the target organization most closely resembles. The facilitator should then guide the organization toward the most appropriate mix of criteria for that type of system.

3.2 Forming the Measurement Development Teams (MDTs)

Basic Considerations. Because it is a participative methodology, the MGEEM is only as effective as its participants. Therefore, the facilitator must work with the commander of the target organization to assure that measurement development team (MDT) members are carefully selected. In selecting members of these teams, the facilitator should be concerned about:

1. Participant Knowledge. Do prospective team members have sufficient knowledge of the organization and its primary work processes to contribute ideas and make meaningful judgments? Such knowledge among members is usually assured by obtaining experienced individuals from a range of grade levels.

2. Participant Communication Skills. Because the MGEEM is a verbal process, the communication skills of participants are important. Not only must participants have knowledge, they must also be able to communicate their knowledge. On the other hand, inexperienced individuals who are verbal tend to create problems for the process. Such individuals, unless carefully managed by the facilitator, can pull the process in inappropriate directions. In addition to these concerns, the facilitator should stress to the commander and senior noncommissioned officer (NCO) the need to have as MDT members a cross-section of the organization and to include people who will "speak their minds" in constructive ways. Management should have the final word in selecting participants because it is management, and not the facilitator, who must live with the results.

3. Position/Influence in the Organization. A basic assumption underlying the MGEEM is that participation in the development of a solution will increase the acceptability of that solution. Therefore, the facilitator should seek to ensure, all else being equal, that key opinion-leaders in the organization are included on the MDTs. Individuals may be opinion-leaders by virtue of

formal or informal power. It is important to identify these key individuals and consider them for participation. A key opinion-leader who is left out can jeopardize acceptance of the resulting MGEEM products.

4. Comprehensiveness. The products from the MGEEM will be best if MDT members have the widest possible information base. Therefore, the best situation is to assure representation from multiple points of view (e.g., all facets of the target organization, next higher level organization, and significant "customer" organizations).

One MDT or Two? In most cases, it is desirable to form two MDTs to broaden participation. A management MDT, called Team A, defines the broad measurable facets of the unit's mission, labeled Key Result Areas (KRAs). A worker-level MDT, called Team B, develops the specific indicators or measures for each KRA. There are exceptions to this guideline. If the organization is small (e.g., 10 - 15 people), then forming two MDTs is probably not feasible. If the organization is comprised of professionals (e.g., researchers, physicians, scientists, engineers, or social workers), who are accustomed to operating in a participative manner, they may be uncomfortable with having only managers involved in developing KRAs. In this case, one MDT comprised of both managers and non-managers should be used to develop both KRAs and indicators.

Guidelines for Team Formation. In determining MDT membership for a typical Air Force organization, you must first (a) identify the target organization (e.g., squadron), (b) identify the next highest level of organization (e.g., wing), and then (c) identify the next two levels below the target organization (e.g., branch and section), as appropriate. Then follow the steps outlined in Table 2.

Table 2. Guide to Determining MDT Membership

Steps	Example
1. List all levels in hierarchical order; identify target organization.	1. Wing 2. Squadron[a] 3. Branch 4. Section 5. Workers
2. If there are two organizational levels below the target organization then: a. Team A consists of levels 1, 2, and 3 b. Team B consists of levels 3 and 4	1. Wing 2. Squadron[a] 3. Branch 4. Section 5. Workers
3. If there is only one level of organization below the target organization, then: a. Team A consists of levels 1, 2, and 3, and "customer" representatives, if possible b. Team B consists of levels 2 and 3	1. Squadron 2. Branch[a] 3. Section 4. Workers
4. If more than two organizational levels can be defined but the next level[b] below the target organization is a worker-level organization, then: a. Team A consists of levels 1, 2, and 3 b. Team B consists of levels 3 and 4	1. Wing 2. Squadron 3. Branch 4. Section[a] 5. Workers
5. If only two organizational levels can be defined, then Teams A and B are the same group and include representation from the level above and the worker level.	1. Branch 2. Section[a] 3. Workers

[a] Indicates target organization.
[b] Level refers to the lowest level with a manager/supervisor.

13

3.3 Developing Key Result Areas (KRAs)

Key Result Areas (KRAs) are the measurable facets of an organization's mission. From the viewpoint of the external environment, they are the reasons that the organization exists. In other words, higher-level organizations, customers, and others have expectations that the target organization will produce certain products or services or will maintain a state of readiness to perform certain activities. Stated in measurable terms, these expectations are the KRAs for an organization. Examples of KRAs developed for a range of Air Force organizations are presented in Appendix C. The following section presents the steps involved in developing KRAs and offers suggestions to the facilitator as to how to implement these steps.

3.3.1 Room Selection and Setup

A key factor in developing KRAs is the ability of the measurement facilitator to function effectively in the physical space arrangement. The room should be well ventilated, with adequate lighting for people to work effectively and comfortably. To ensure sufficient wall space for hanging chart paper, there should be at least 20 linear feet of wall space free of pictures, windows, doors, and other obstructions. The room size should be sufficient to accommodate a long conference table or U-shaped arrangement of tables which faces a long wall. In addition to a conference table, the setup should include at least one easel with chart paper pad, as well as markers, masking tape, and index cards. Having markers of three different colors is helpful for editing the KRAs generated in group sessions.

3.3.2 Initial Briefing

Assuming the steps recommended in the implementation plan have been carried out, participants should be aware of the purposes of the measurement process for their organization. Next, an initial briefing should be provided at the MCT meetings. This briefing should accomplish the following objectives:

1. Explain the steps in the MGEEM measurement development process;
2. Create the proper mental set for KRA development; and
3. Explain KRAs and discuss their role in the MGEEM process.

A recommended agenda and example of this initial briefing are provided in Appendix D.

3.3.3 Posing the Question

The facilitator uses the nominal group technique (NGT) (see Delbecq, Van de Ven, & Gustafson, 1975) to initiate the MGEEM process by writing a question to be answered on a sheet of chart paper and hanging it on the wall where it can be seen by all participants. In posing this question, the facilitator should say:

THIS IS THE QUESTION I WOULD LIKE YOU TO ANSWER. (At this point, write the following question on the chart paper.) "What types or categories of results does the Air Force expect this organization (name the target organization) to accomplish?"

AS YOU THINK ABOUT THIS QUESTION, ALL OF YOU SHOULD PUT YOURSELVES IN THE POSITION OF THE COMMANDER OF YOUR ORGANIZATION. IN OTHER WORDS, TODAY, YOU ARE PLAYING BOSS!

3.3.4 Silent Generation of Answers

Participants are then asked to "silently generate" answers to the question posed by the facilitator. This process is important since the resulting answers serve as the primary content for the remainder of the process. Sufficient time should be allowed so that participants do not feel rushed and have time to reflect on their answers. Usually 10 to 15 minutes is sufficient. To begin this process, the facilitator should say:

> ON A SHEET OF PAPER WRITE A LIST OF YOUR ANSWERS TO THIS QUESTION. PLEASE DO THIS INDIVIDUALLY WITHOUT DISCUSSION. TAKE AS MUCH TIME AS YOU NEED TO FULLY ANSWER THE QUESTION. DOES ANYONE HAVE ANY PROBLEMS WITH THE QUESTION AS IT IS STATED? (At this point, some participants may want to change a word or discuss the question. Minor changes in wording can be made in order to help participants accept the question. It is important that participants become committed to the task at this point.) IF THERE ARE NO FURTHER QUESTIONS, THEN BEGIN.

3.3.5 Round-Robin Listing

In this activity, answers generated by individual participants in the first phase are recorded on chart paper as quickly as possible. This process is conducted without comment or discussion, except for clarification in order to accurately and legibly record answers. The facilitator moves around the group in round-robin fashion, getting one answer from each participant. This process continues until all participants say "pass," indicating that all of their answers have been recorded.

To begin this process, the facilitator should say:

> NOW WE WOULD LIKE TO HAVE YOU READ YOUR ANSWERS ONE AT A TIME SO THAT WE CAN RECORD THEM ON CHART PAPER. THE OBJECTIVE IS TO WRITE YOUR ANSWERS AS QUICKLY AS POSSIBLE; THEREFORE, WE WILL NOT HAVE ANY DISCUSSION OF ANSWERS AS THEY ARE WRITTEN, EXCEPT TO CORRECT INACCURACIES. I WILL START WITH - (name a participant) - THEN PROCEED AROUND THE TABLE IN ROUND-ROBIN FASHION UNTIL ALL YOUR ANSWERS HAVE BEEN TRANSFERRED TO THE CHART PAPER. (Name a participant), WILL YOU GIVE ME ONE ANSWER OFF YOUR LIST? (Once the answer is written, ask the participant if the item is OK. If not, then make any necessary corrections. If it is OK, then proceed to the next person and write his/her first answer. Continue in this manner until all answers are on the chart paper.)

A sample listing of original KRAs from a food service organization is shown in Table 3.

3.3.6 Discussion and Clarification

Once all answers (KRAs) are listed, the facilitator leads the group through a review process. The purpose of the review process is to provide an opportunity to modify KRAs so as to improve their clarity and accuracy and reduce overlap. At this time, participants may ask questions to have the meaning of KRAs explained. Another purpose of the review process is to combine KRAs, as appropriate, to remove redundancy or to achieve a consistent level of KRA specificity. KRAs may be combined if they are too narrow or specific. Consistent specificity can be achieved by breaking KRAs that are too broad into two or more KRAs. As a guide, a typical

initial KRA list might contain from 30 to 50 answers. Following discussion and clarification, this number should be reduced by 20% to 40%. The modified list of original KRAs in Table 3 is shown in Table 4.

Table 3. Original Key Result Areas (KRAs) - Food Service

1. Provide quality meals to customers.
2. Best possible variety of food.
3. Ensure effective training programs.
4. Quality facilities.
5. Equipment turnover - 5-year plan for replacement of equipment.
6. Organize and manage supervisors to operate facilities.
7. Maintain acceptable/sanitary housekeeping conditions.
8. Maintain effective relationships with other base agencies.
9. Satisfy customers through consistent quality, variety, service, and quality facilities.
10. Maintain adequate manpower to reach objectives.
11. Effective quality assurance evaluation.
12. Control and safeguard inventory - food and supplies.
13. Provide sufficient personnel to satisfy deployment needs without sacrificing production at home or exceeding normal work hours.
14. Set a good example for people to follow - support the people; maintain standards; reward and recognize people; maintain morale, esprit, and job satisfaction; and maintain quality facility for staff.
15. Meet the required schedules and respond to emergency needs.
16. Support the wing/base mission, and maintain effective relationships with other agencies.
17. Make productive/efficient use of available resources; obtain adequate funding for equipment/supplies.
18. Maintain fiscal accountability.
19. Continue to improve operations rather than stagnate.
20. Compliance with regulations; e.g., fiscal accountability, meeting suspenses, inventory control, sanitation, budgeting, and obtaining funding.
21. Satisfy wing commander.
22. Be versatile, creative, innovative, and imaginative.
23. Support his/her people.
24. Food service long-range planning.
25. Maintain required documentation.
26. Be able to tell your boss "like it is."
27. Manage the gray areas.
28. Identify, report, and follow up on equipment maintenance.
29. Develop realistic budgets and obtain funding.
30. Provide satisfactory workplace for our people.
31. Provide quality food at correct selling price.
32. Zero defects on fraud, waste, and abuse.

(9) 1. ~~Provide quality meals to customers.~~
(9) 2. ~~Best possible variety of food.~~
3. Ensure effective training programs.
4. Quality facilities.
5. Equipment turnover - 5-year plan for replacement of equipment.
6. ~~Organize and manage supervisors to operate facilities.~~
7. Maintain acceptable/sanitary housekeeping conditions.
8. Maintain effective relationships with other base agencies.
9. Satisfy customers through consistent quality, variety, service, and quality facilities.
10. ~~Maintain adequate manpower to reach objectives.~~
11. Effective quality assurance evaluation.
12. Control and safeguard inventory - food and supplies.
13. Provide sufficient personnel to satisfy deployment needs without sacrificing production at home or exceeding normal work hours.
14. Set good example for people to follow - support the people; maintain standards; reward and recognize people; maintain morale, esprit, and job satisfaction; and maintain quality facility for staff.
15. Meet required schedules and respond to emergency needs.
16. Support the wing/base mission, and maintain effective relationships with other agencies.
17. Make productive/efficient use of available resources; obtain adequate funding for equipment/supplies.
18. Maintain fiscal accountability.
19. Continue to improve operations rather than stagnate.
20. Compliance with regulations; e.g., fiscal accountability, meeting suspenses, inventory control, sanitation, budgeting, and obtaining funding.
21. Satisfy wing commander.
22. Be versatile, creative, innovative, and imaginative.
(14) 23. ~~Support his/her people.~~
(5) 24. ~~Food service long-range planning.~~
(16)(11)(7) 25. ~~Maintain required documentation.~~
26. ~~Be able to tell your boss "like it is."~~
27. ~~Manage the gray areas.~~
(17) 28. ~~Identify, report, and follow up on equipment maintenance.~~
(18) 29. ~~Develop realistic budgets and obtain funding.~~
(14) 30. ~~Provide satisfactory workplace for our people.~~
(11) 31. ~~Provide quality food at correct selling price.~~
(20) 32. ~~Zero defects on fraud, waste, and abuse.~~

3.3.7 Vote 1

Participants are next asked to select KRAs from the original list which they feel are the most important for the unit. The facilitator determines the number to be selected. Generally, having the group select 5 to 7 is recommended. Although limiting KRAs to this number is difficult, it helps the group focus on an appropriate level of specificity. It also serves to highlight areas of agreement or disagreement within the group with respect to the priorities of the organization.

The facilitator can conduct the voting process as follows:

NOW THAT YOU HAVE HAD AN OPPORTUNITY TO DISCUSS THE KRAs, IT IS TIME TO PRIORITIZE THEM. PLEASE BEAR WITH ME BECAUSE THIS VOTING PROCESS IS A BIT TEDIOUS. HOWEVER, IT IS IMPORTANT THAT YOU FOLLOW THE PROCESS EXACTLY. YOU WILL USE THE INDEX CARDS ON THE TABLE. EACH PERSON SHOULD HAVE SEVEN (7) INDEX CARDS.

FIRST, LOOK AT THE KRAs WHICH REMAIN. (At this point, the facilitator circles in red on the chart paper the numbers of the KRAs eligible for voting). FROM THIS LIST OF KRAs, SELECT THE SEVEN WHICH YOU FEEL ARE MOST IMPORTANT IN TERMS OF ANSWERING THE QUESTION WE INITIALLY POSED. REMEMBER, AS YOU MAKE THIS SELECTION, YOU SHOULD VIEW THIS PROCESS FROM THE UNIT COMMANDER'S VIEWPOINT. THAT IS, WHICH OF THESE ITEMS WOULD THE COMMANDER CONSIDER MOST IMPORTANT? ONCE YOU HAVE SELECTED SEVEN KRAs, WRITE EACH KRA AND ITS NUMBER, ONE AT A TIME, ON THE INDEX CARDS YOU HAVE BEEN GIVEN. WRITE THE KRA NUMBER IN THE UPPER LEFT CORNER OF THE CARD AND THE KRA ITSELF IN THE MIDDLE OF THE CARD. (It is helpful for the facilitator to draw a sample card on the chart paper to illustrate where to write the KRA and its number.)

```
 _____
| 3                         |
|                           |
|            KRA            |
|                           |
|                           |
|                           |
|                           |
|_____|
```

WHEN YOU HAVE COMPLETED THIS STEP, LAY OUT ALL 7 CARDS ON THE TABLE IN FRONT OF YOU.

CONSIDER ONLY THE SEVEN CARDS IN FRONT OF YOU. OF THESE SEVEN KRAs, WHICH IS MOST IMPORTANT? SELECT THAT KRA AND WRITE THE NUMBER 7 IN THE LOWER RIGHT CORNER OF THE CARD. TURN THAT CARD OVER. (The facilitator should illustrate this by writing the number in the lower right corner of the card drawn on the chart paper.)

```
 _____
| 3                         |
|                           |
|            KRA            |
|                           |
|                           |
|                           |
|                        7  |
|_____|
```

OF THE SIX REMAINING KRAs, WHICH IS LEAST IMPORTANT? WRITE THE NUMBER 1 IN THE LOWER RIGHT CORNER OF THAT CARD. TURN THE CARD OVER. OF THE FIVE REMAINING KRAs, SELECT THE ONE THAT IS MOST IMPORTANT AND WRITE A 6 IN THE LOWER RIGHT CORNER OF THE CARD. TURN THE CARD OVER. OF THE FOUR REMAINING KRAs, SELECT THE ONE THAT IS LEAST IMPORTANT AND WRITE A 2 IN THE LOWER RIGHT CORNER. TURN THE CARD OVER. OF THE REMAINING THREE KRAs, SELECT THE ONE THAT IS MOST IMPORTANT AND WRITE A 5 IN THE LOWER RIGHT CORNER OF THE CARD. TURN THE CARD OVER. OF THE REMAINING TWO KRAs, SELECT THE ONE THAT IS LEAST IMPORTANT AND WRITE A 3 IN THE LOWER RIGHT CORNER. TURN THE CARD OVER. WRITE A 4 IN THE LOWER RIGHT CORNER OF THE REMAINING CARD. THIS COMPLETES THE VOTING PROCESS. PLEASE GIVE ME YOUR CARDS. (As the votes are tallied, it is a convenient time to give the group a break. The tally can be recorded as shown in Table 5.)

Table 5. Food Service Key Result Areas - Vote 1 Results

===

(Voting Instructions to eight group members: Select the seven KRAs that you
feel are most important)

KRA NO.	VOTING PATTERN	VOTING SUMMARY
3.	5-2-4-4-4	5/19[a]
4.	1-3-4-1	4/9
5.	4-1-5-1-3	5/14
7.	2-5	2/7
8.	4	1/4
9.	7-7-6-6-1-7-5-7	8/46
11.	3-2	2/5
12.	3	1/3
13.	2-2	2/4
14.	6-4-7-6-2-6	6/31
15.		
16.	6-5-7-7-7	5/32
17.	3-5-2-6-6	5/22
18.	3-1-3	3/7
19.	3	1/3
20.	2-4-1	3/7
21.		
22.	1-5-5	3/11

[a]Indicates that five of the eight participants selected KRA Number 3.
and the sum of its assigned weights was 19 (5+2+4+4+4).

3.3.8 Tallying the Voting Results

The facilitator tallies the results of the voting as follows:

1. Generate a chart paper sheet, listing in the left column in ascending order the numbers
of all KRAs that survived the discussion and clarification process. An example is shown in Table
5 under the column marked "KRA NO." Note in Table 4 that KRAs 1, 2, 6, 10, and 23 through 32 did
not survive the discussion and clarification process and, consequently, do not appear in Table 5.

2. Sort the index cards from the eight participants into stacks according to the KRA numbers
in the upper left corners of the cards.

3. Pick up the stack of index cards with the lowest KRA number. In Table 5, the lowest
remaining KRA number is 3. For the index cards in this stack, record in the middle column on the
chart paper (the column in Table 5 labeled "VOTING PATTERN") the weights assigned in Vote 1 by
the team members. These weights are the numbers in the lower right corner of the stack of cards
for KRA 3. As shown in Table 5, KRA 3 was selected by five participants who gave weights of
5-2-4-4-4.

4. Finally, record in fractional form, in the right column of the chart paper (in Table 5,
this is labeled "VOTING SUMMARY"), a summary of the voting results for the KRAs. The numerator
is the number of team members who selected the KRA as important, and the denominator is the sum
of the weights assigned by the team members who thought the KRA was important. The fraction for
KRA 3 is 5/19. Five team members identified KRA 3 as important, and the sum of their assigned
weights is 19 (5+2+4+4+4).

5. Continue this process for each KRA. An example of results is shown in Table 5.

3.3.9 Discussion of Vote 1

The discussion that follows the first vote is an important step in the MGEEM process with respect to (a) the quality of the resulting product and (b) the degree of participant commitment to the result. If there is complete consensus following vote 1, this discussion is unnecessary. However, complete consensus is rare at this point. Therefore, the purpose of this discussion is to bring out additional information that will promote consensus and modify KRAs in ways that will promote greater consensus. The facilitator's role is to guide the group through this discussion, always focusing on the KRAs and on ways to make them more meaningful, less ambiguous, or more accurately stated. The facilitator should use the voting pattern from vote 1 as the starting point for this discussion. The discussion should center around KRAs for which more than one participant voted, but which show a reasonably wide spread in the voting pattern. For example, in discussing the voting pattern shown in Table 5, the facilitator might say:

> NOW WE ARE GOING TO DISCUSS THE VOTING PATTERN THAT RESULTED FROM YOUR FIRST VOTE. AS YOU CAN SEE, THE GROUP DOES NOT SEE THINGS EXACTLY THE SAME WAY. IN THIS DISCUSSION, WE WILL BE ATTEMPTING TO MAKE THE KRAs BETTER, NOT "TWIST YOUR ARMS" TO GET YOU TO VOTE IN A CERTAIN WAY. HOWEVER, IT IS OUR GOAL TO ACHIEVE AS MUCH AGREEMENT AS POSSIBLE AMONG GROUP MEMBERS.

> LET'S LOOK FIRST AT KRA NUMBER 3. FIVE PEOPLE VOTED FOR THIS KRA AND THREE PEOPLE DID NOT. THOSE WHO SELECTED IT RATED IT 5-2-4-4-4. WOULD SOMEONE WHO BELIEVES THAT THIS KRA IS IMPORTANT PLEASE TELL US WHAT CAUSED YOU TO SELECT IT? (Now allow time for this person to point out the strengths - 1 or 2 minutes is sufficient - don't allow long speeches.) WOULD ANYONE ELSE LIKE TO SAY WHY THEY VOTED FOR THIS KRA? (Continue until anyone who wants to talk has had the opportunity to argue briefly for the KRA.)

> NOW, COULD SOMEONE WHO DID NOT SELECT THIS KRA TELL WHY YOU DID NOT BELIEVE THIS IS ONE OF THE TOP KRAs? (Continue the discussion, as before, until all issues are aired.)

> NOW THAT WE HAVE HEARD THIS DISCUSSION, WHAT CHANGES SHOULD WE MAKE IN THE KRA? SHOULD IT BE COMBINED WITH ANOTHER KRA? (The facilitator is guided by the group either to make no changes to the KRA, to modify it, to delete it, or to combine it with another KRA. If a KRA is to be combined with another, draw a line through the KRA and beside it write the number of the KRA with which it is being combined, encircling the number as shown in Table 4.)

The discussion should seek consensus by making sure group members share a common understanding of the meaning of KRAs. This is done by allowing participants to attempt to influence each other's judgments by adding new information about KRAs, such as history of the organization or future trends that may influence priorities, customer or higher headquarters views, etc. This should be an open information-sharing and clarification session. It must not be a coercive, arm-twisting discussion.

3.3.10 Vote 2

Following the discussion, the voting process carried out in 3.3.7 is repeated for the remaining KRAs. Again, five to seven KRAs should be selected as the most important. If the facilitator believes that there are important unresolvable disagreements among the participants, the number of KRAs may be increased from 7 to 9, although this is usually unnecessary. The

number of KRAs voted on is not necessarily the number of KRAs that will eventually be retained and recommended to management. In this example, the KRAs eligible for Vote 2 would be all those listed in Table 5 except Nos. 15 and 21, which were not selected by any participant in Vote 1. Those selected by Vote 2 are shown in Table 6.

Table 6. Food Service Key Result Areas - Vote 2 Results

KRA NO.	VOTING PATTERN	VOTING SUMMARY	RANK
3	2-4-1-6-3-2-3-3	8/24	5.5
5	1-5-6-3-2-3-2-2	8/24	5.5
9	6-7-7-7-4-6-6-7	8/50	1
13[a]	3-4-4-1	4/12	8
14	4-6-3-7-5-5-6	7/36	2
16	3-1-5-5-1-7-7-5	8/34	3
17	7-1-6-4-4-4	6/26	4
20	5-2-2-2-5-1-1	7/18	7

[a]KRA dropped by consensus following Vote 2.

3.3.11 Documenting Results

Following the second vote, sufficient consensus is normally achieved, and the process can be ended. If not, the facilitator repeats steps 3.3.9 and 3.3.10 until sufficient agreement is obtained. Once the process is terminated, the facilitator documents the process. Forms for recording the KRA development process are provided in Appendix E. A format for reporting the final results of the session is shown in Table 7.

Table 7. Food Service - Final Key Result Areas

VOTE (max = 8/56)	RANK	KRA
8/50	1	Customer Satisfaction. Satisfy customers through consistent quality and variety of food and service and through providing and maintaining quality facilities.
7/36	2	Human Resource Management/Leadership. Maintain a motivated work force with high morale, esprit, and job satisfaction; involve work force in decision making; implement creative and innovative practices; encourage high performance through recognizing and rewarding personnel; and provide leadership by example.
8/34	3	Support. Maintain productive relationships with other base agencies supported and upon whom the organization depends for support.
6/26	4	Productivity of Resources. Make productive/efficient use of all available resources.
8/24	5.5	Equipment Availability. Provide equipment required to accomplish the food service mission.
8/24	5.5	Training Effectiveness. Ensure that personnel are effectively trained.
7/18	7	Administrative Compliance. Comply with Air Force/MAJCOM regulations and requirements.

3.4 Developing Indicators

The next step in the MGEEM process is the development of performance indicators. Performance indicators are the measurement tools used to know if KRAs are being accomplished. Indicators may take several forms, although they typically are ratios which compare some aspect of performance (e.g., number of transactions processed successfully) to some reference point (e.g., total number of transactions processed) or to some measure of resource input (e.g., number of hours worked). In practice, it is common to relate the ratio for a point in time to a base period to detect changes in an indicator from one measurement period to another. In the MGEEM process, indicator development is a multi-step process. The steps involve indicator definition, prioritization of indicators, management review and refinement, and implementation. These steps are discussed in the sections which follow.

3.4.1 Convening the Indicator Development Team

The indicator development team is Team B. Considerations in selecting the members of this team are outlined in Section 3.2. Once selected, the indicator development team members are invited to the indicator development session. This invitation should come from the unit commander of the target organization. The invitation memo or letter should contain information about the time and location of the session, its purpose, and the amount of time required.

3.4.2 Briefing Team B Members

Team B members should be given the overview briefing given to Team A (see Section 3.3.2). In addition, the initial briefing of Team B should include identification of the characteristics of good indicators, an overview of indicator types, and sample indicators from other Air Force organizations. A recommended agenda and briefing are in Appendix F. Following the briefing, Team B members should be given the quiz in Appendix G to serve as a review and to heighten the distinction between efficiency and effectiveness. The facilitator should stress this distinction because Air Force organizations tend to pay more attention to effectiveness (accomplishing mission objectives) than to efficiency (the best use of resources to produce products and services).

3.4.3 Discussion of KRAs Developed by Team A

Prior to indicator development, Team B members should review the final KRAs developed by Team A. In the example of KRA development given above, Team B would be asked to review the data presented in Table 7. The facilitator should ask one of the Team B members who was also a Team A member to comment on each of the KRAs. The purpose of this review is not to modify KRAs, but to provide Team B members with a framework for thinking about the mission of the organization and to achieve a sense of their "ownership" of the KRAs. If the KRAs are presented as a fait accompli to Team B, some resistance may develop.

3.4.4 Using the Nominal Group Technique (NGT) to Develop Indicators

The NGT process is again used to develop indicators. The process begins, as with KRA development, with the facilitator's writing on chart paper the question to be answered and hanging the sheet on the wall where all can see it. The facilitator begins by saying:

OUR TASK IS TO DEVELOP A SET OF INDICATORS THAT WILL ALLOW US TO DETERMINE IF THE ORGANIZATION IS ACHIEVING THE RESULTS DESCRIBED IN THE LIST OF KRAs. WE WILL ACCOMPLISH THIS BY HAVING THIS GROUP ANSWER THE FOLLOWING QUESTION FOR EACH KRA. THE QUESTION IS: (At this point the facilitator writes the question on chart paper or reveals the question that has previously been written.) What quantitative indicators should the commander track on a periodic basis to tell if this KRA is being accomplished? WE WILL ANSWER THIS QUESTION FOR EACH OF THE KRAs.

Once members of the group have indicated their understanding and acceptance of this question, the facilitator begins the process by selecting the KRA that will be easiest to measure. Experience shows that there is a learning curve with the MGEEM indicator development process. The first time through the steps, Team B members are usually unsure of what is expected of them. The KRA for which indicators are easiest to develop will be one that is concrete, product- or service-oriented, and one for which there are currently existing indicators. In most Air Force organizations there are reporting requirements to higher headquarters on principal workloads. Selecting a KRA that pertains to work products currently tracked is advised. The facilitator may wish to allow Team B to make the decision about which KRA to use to start the indicator development process.

For example, the facilitator could say: WE WOULD LIKE TO BEGIN WITH THE KRA THAT WILL BE EASIEST TO MEASURE. THIS WILL HELP US BECOME MORE COMFORTABLE WITH THE PROCESS. WHICH KRA DO YOU SUGGEST?

3.4.4.1 Silent Generation of Answers. Team members are next asked to use the indicator development worksheet in Appendix H as they think of indicators for the selected KRA. They should be instructed to think of both efficiency and effectiveness indicators and write them on the worksheet. The facilitator should allow sufficient time for participants to consider and list indicators without discussion among themselves. Team members should be reminded that this is an individual, silent task. The opportunity for discussion will come later. To begin the process the facilitator could say:

USING THE INDICATOR DEVELOPMENT WORKSHEET, PLEASE LIST THE EFFICIENCY AND EFFECTIVENESS INDICATORS THAT YOU FEEL ARE ANSWERS TO THE QUESTION WRITTEN ON THE CHART PAPER. PLEASE DO THIS INDIVIDUALLY WITHOUT DISCUSSION. TAKE AS MUCH TIME AS YOU NEED TO FULLY ANSWER THE QUESTION. BE SURE TO TRY TO DEVELOP BOTH EFFICIENCY AND EFFECTIVENESS INDICATORS. ARE THERE ANY QUESTIONS? (Take time to answer any questions posed by participants.) IF NOT, THEN BEGIN.

3.4.4.2 Round-Robin Listing. The next step is to transfer the indicators that members have generated onto chart paper so that all members of the team can review and discuss them. The facilitator's task here is to move around the group, getting one indicator per person, and on the chart paper, writing that indicator exactly as stated. After writing the indicator, the facilitator should confirm that the indicator is properly recorded by asking the team member who offered it if the indicator is written correctly. Once the indicator is approved, then the facilitator moves to the next member, and so on until all members say "Pass." The result of round-robin listing might appear as shown in Table 8.

Table 8. Original Indicators - Supply

KRA No. 1 - Customer Satisfaction

1. Average Response Time/Expected Response Time

2. Customer Wait Time for Issues

3. No. of Customer Inquiries/No. of Productive Hours in Customer
    Assistance Function

4. Fill Rate on Requisitions

5. No. of Documented Customer Complaints

6. Average Turnaround Time from Date of Request to Date of Delivery
    by Priority Category

7. No. of Complaints About Quality of the Product That Are
    Resolved/Total No. of Complaints About Product Quality

8. Percentage of Customers Responding to Survey Who Report Satisfaction
    with Supply Service

9. No. of Complaints Received/No. of Transactions Processed

10. Average Requisition Processing Time

11. Customer Inquiries Satisfied/Customer Inquiries Received

12. Supply Transactions Processed/No. of Productive Hours

3.4.4.3 Discussion and Clarification. The next step is reviewing the list of indicators produced. Here, the facilitator leads the group through a consideration of each indicator one at a time. This review could begin with the facilitator's saying:

> WE NOW HAVE A CHANCE TO DISCUSS EACH OF THE PROPOSED INDICATORS. AT THIS STAGE IN THE PROCESS, WE ARE TRYING TO REFINE THE INDICATORS TO MAKE THEM MORE PRECISE. WE ARE ALSO CONCERNED WITH REDUCING REDUNDANCY AMONG THE INDICATORS. NOW, LET'S LOOK AT INDICATOR NUMBER 1. ARE THERE ANY QUESTIONS ABOUT WHAT THIS INDICATOR MEANS? HOW OFTEN WOULD THIS INDICATOR BE TRACKED? WEEKLY? MONTHLY? QUARTERLY? ANNUALLY? DOES IT OVERLAP ANY OTHER INDICATORS ON THE LIST? IF SO, WHICH ONE SHOULD WE KEEP?

The facilitator should proceed in this manner through the list of indicators. At the beginning of the discussion and clarification step, there will be a list such as that shown in Table 8; at the end of the step, the list might look like that in Table 9.

Table 9. Original Indicators - Supply - Following Discussion
and Clarification

KRA No. 1. Customer Satisfaction	Time Period
1. ~~Average Response Time/Expected Response Time~~	
2. Customer Wait Time for Issues	Monthly
3. No. of Customer Inquiries/No. of Productive Hours in Customer Assistance Function	Monthly
4. Fill Rate on Requisitions	Monthly
5. ~~No. of Documented Customer Complaints~~	
6. ~~Average Turnaround Time from Date of Request to Date of Delivery by Priority Category~~	
7. ~~No. of Complaints About Quality of the Product That Are Resolved/Total No. of Complaints About Product Quality~~	
8. Percentage of Customers Responding to Survey Who Report Satisfaction with Supply Service	Semi-Annually
9. No. of Complaints Received/No. of Transactions Processed	Monthly
10. Average Requisition Processing Time	Monthly
11. Customer Inquiries Satisfied/Customer Inquiries Received	Monthly
12. Supply Transactions Processed/No. of Productive Hours	Monthly

3.4.4.4 Vote 1. This step of the MGEEM process serves to eliminate undesirable and impractical indicators. It also produces a ranking of indicators with respect to their importance as judged by Team B members. This information is valuable to the commander as an indication of the performance areas perceived as important by his/her subordinates. To the extent that the most important areas are not currently being tracked by the organization, attention should be dedicated to doing so. If this is not feasible, then the commander should explain to the organization why it is not necessary.

If, after the preceding step, there are less than five indicators, their ranking can usually be done by consensus. Consensus ranking has two steps, which may be explained by the facilitator as follows:

> OF THE REMAINING INDICATORS, WHICH IS THE MOST IMPORTANT IN TERMS OF ANSWERING THE QUESTION WE INITIALLY POSED? (At this point someone will say a number; e.g., number 2.) O.K., IS THERE ANY OBJECTION TO LISTING NUMBER 2 AS THE MOST IMPORTANT INDICATOR? (If no objection is stated, then move to the next item until all have been ranked.)

Once the indicators have been ranked, the facilitator asks the group to determine how many of the ranked indicators are of sufficient value that management should be encouraged to track them

on an ongoing basis. That is, the group should decide whether the organization's resources should be committed to measuring the indicators. This feasibility review proceeds in reverse order of the rankings. Assuming that four indicators had been ranked by consensus, the facilitator would point to indicator rank number four and say:

> SHOULD THE ORGANIZATION COMMIT RESOURCES TO CAPTURE AND REPORT THIS INFORMATION? SHOULD WE KEEP THIS INDICATOR ON OUR LIST?

If the consensus is "no," then drop that indicator and move up to the next. The process continues until an indicator is encountered that at least some members feel should be retained. Total consensus is required to drop an indicator. Since the indicators are addressed in reverse order of importance, the first indicator that the group decides to keep ends the review process, and all remaining indicators are considered valid. If the discussion and clarification step results in more than five indicators, a vote is recommended. Prior to the vote, each team member should be given a set of five index cards. The facilitator then instructs the group as follows:

> PLEASE REVIEW THE INDICATORS THAT REMAIN AFTER COMPLETION OF THE DISCUSSION AND CLARIFICATION STEP. SELECT THE FIVE INDICATORS THAT YOU FEEL ARE THE MOST IMPORTANT IN TERMS OF ANSWERING THE QUESTION POSED AT THE BEGINNING OF THIS PROCESS.
>
> ONCE YOU HAVE SELECTED FIVE INDICATORS, WRITE THEM - ONE PER CARD - ON THE INDEX CARDS PROVIDED. THE INDICATOR STATEMENT SHOULD BE WRITTEN IN THE CENTER OF THE CARD AND THE NUMBER OF THE INDICATOR FROM THE CHART PAPER SHOULD BE WRITTEN IN THE UPPER LEFT CORNER OF THE CARD. (At this point, the facilitator should illustrate this on chart paper as shown below.)

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9


   No. of Complaints Received/No.
   of Transactions Processed



```

> NOW THAT YOU HAVE SELECTED FIVE INDICATORS, SPREAD THE FIVE INDEX CARDS OUT ON THE TABLE IN FRONT OF YOU SO THAT YOU CAN SEE ALL FIVE CARDS.
>
> LOOKING AT THE FIVE CARDS IN FRONT OF YOU, PICK THE INDICATOR THAT IS MOST IMPORTANT IN TERMS OF ITS ANSWER TO THE QUESTION POSED AT THE START OF THIS SESSION. ONCE YOU HAVE SELECTED THE INDICATOR, INDICATE YOUR CHOICE BY WRITING A 5 IN THE LOWER RIGHT CORNER OF THE CARD. YOUR CARD SHOULD LOOK LIKE THIS. (Using the card previously drawn on chart paper (see above), write a 5 in the lower right corner of the card as shown below.)

```
9


   No. of Complaints Received/No.
   of Transactions Processed


                             5
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NOW, TURN THAT CARD OVER. FROM THE FOUR REMAINING INDICATORS, SELECT THE INDICATOR
THAT IS LEAST IMPORTANT IN TERMS OF ITS ANSWER TO THE QUESTION. INDICATE YOUR
CHOICE BY WRITING A 1 IN THE LOWER RIGHT CORNER OF THAT CARD. TURN THAT CARD OVER.

NEXT, FROM THE THREE REMAINING CARDS, SELECT THE INDICATOR THAT IS MOST IMPORTANT
AND WRITE A 4 IN THE LOWER RIGHT CORNER. TURN THAT CARD OVER.

FROM THE TWO REMAINING INDICATORS, SELECT THE ONE THAT IS LEAST IMPORTANT AND WRITE
A 2 IN THE LOWER RIGHT HAND CORNER. FOR THE REMAINING INDICATOR, WRITE A 3 IN THE
LOWER RIGHT CORNER.

After this vote is completed, the facilitator collects the cards and, if appropriate, allows
participants to take a short break while the vote results are tallied. If a break is not needed,
the facilitator directs participants to begin silent generation of indicators for the next KRA.
The facilitator should tally the results of the voting according to the procedure described in
3.3.8: (a) Generate a chart paper sheet with the numbers for all indicators that survived the
discussion and clarification process in the left column in ascending order. Example results for
an 8-member team are shown in Table 10. Note under the column marked "INDICATOR NO" that
indicators 1, 5, 6, and 7 shown in Table 9 did not survive the discussion and clarification
process and, consequently, do not appear in Table 10. (b) Sort the index cards into stacks
according to the KRA numbers in the upper left corners of the cards. (c) Pick up the stack of
index cards with the lowest indicator number. In the case of the indicators in Table 10, the
lowest indicator number is 2. For the index cards in this stack, write in the second column on
the chart paper (the column in Table 10 marked "VOTING PATTERN") the weights assigned in vote 1
by the team members. These weights are the numbers in the lower right corner of the stack of
cards for indicator 2. Indicator 2 was selected by four of the seven participants, who gave it
weights of 1-1-5-2. (d) Finally, in the right column of the chart paper (see Table 10) labeled
"VOTING SUMMARY," write the fractions which summarize the voting results for the indicators. The
numerator is the number of team members who selected the indicator as important, and the
denominator is the sum of the weights assigned by the team members who thought the indicator was
important. The fraction for indicator 2 is 4/9. Four team members identified indicator 2 as
important, and the sum of their assigned weights is 9 (1+1+5+2).

Table 10. **Voting Tally Sheet - Indicators Vote 1**

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Function: Supply
KRA No. 1. Customer Satisfaction

INDICATOR NO.	VOTING PATTERN	VOTING SUMMARY
2	1-1-5-2	4/9
3	5-2-1-4-1-4-1-2	8/20
4	3-3	2/6
8	2-3-2-1-1-3	6/12
9	3-3-3-5-4	5/18
10	5-5-2	
11	4-4-5-3-4-1-4	
12	4-2-2-5	4/13

Normally one vote is sufficient to screen and prioritize indicators. However, if the
facilitator feels that the group has not adequately discussed the indicators or if there is a
strong split in the group (as shown by the voting pattern), then additional discussion and a
second vote is warranted. However, the need for a second vote is rare.

Following the tally, the facilitator begins another cycle by picking the next KRA and having the group develop individual answers to the question of how best to measure the KRA (see 3.4.4.1).

3.4.5 Documenting the Process

The facilitator must ensure that the total process is documented. The indicator development worksheet in Appendix H suggests a format for this documentation. For each KRA, the facilitator should record the original indicators suggested, the voting pattern, and the final indicators. Table 11 is an example of a final indicator report.

Table 11. Final Indicators

Key Result Area No. 1 - Customer Satisfaction

VOTING SUMMARY (Max = 8/40)	RANK	INDICATOR
7,25	1	No. of customer inquiries satisfied/ No. of customer inquiries received (monthly)
8/20	2	No. of customer inquiries/No. of productive hours in customer assistance function (monthly)
5/18	3	No. of complaints received/No. of transactions processed (monthly)
6/12	4	Percentage of customers responding to survey who report satisfaction with supply service (semi-annually)

3.5 Screening Indicators and Identifying Data Sources

Once Team B has completed its task of defining and prioritizing indicators for each KRA, the indicators are reviewed by the management of the target organization. The essential participants in this review are the commander of the target organization and the measurement facilitator. The commander may want to include in this review group the person who is most knowledgeable of the administrative practices of the organization and other key managers whose support is needed to implement the measurement process.

3.5.1 Preparing Handout Materials

Prior to the review session, the facilitator ensures that there are sufficient copies of the final indicator lists for each KRA (Table 11) to pass out to attendees. These lists are the primary input to this review session. In addition, the facilitator should have an adequate number of indicator review sheets (Appendix I) to record the results of the review session. One copy of the indicator review sheet is needed for each participant, and the facilitator needs one copy for each indicator so that he/she can record results. Ideally, the lists of indicators (Table 11) can be distributed to all participants before the meeting so they can review the indicators in advance.

3.5.2 Convening the Review Session

The facilitator should schedule a review session with the unit commander. From 2 to 3 hours should be set aside for this review.

3.5.3 Conducting the Review

The purpose of the session is to review all indicators recommended by Team B, in order to select those to be used to measure performance in the target organization. In reviewing indicators, the management team has several options: delete an indicator, modify an indicator, retain an indicator as stated, or defer action on selection until further research is done to examine its feasibility. The facilitator should press for decisions on all indicators. Part of the decision process relative to deleting, retaining, or modifying indicators involves considering sources of data used for their creation. Therefore, the facilitator needs to capture the data source as specifically as possible for any indicator to be retained. The indicator review form establishes structure in the indicator review meeting. To begin the meeting, the facilitator distributes a review form to each participant, then says:

> OUR PURPOSE IS TO DECIDE WHICH INDICATORS WILL BE INCLUDED IN THE FINAL INDICATOR SET FOR THIS ORGANIZATION (The flow chart of the five questions shown below is presented to the group on chart paper.) THIS FLOW CHART HIGHLIGHTS THE IMPORTANT CONSIDERATIONS IN OUR EVALUATION OF INDICATORS. FOR EACH INDICATOR, I WILL ASK YOU THE FOLLOWING QUESTIONS:
>
> 1. DO YOU CURRENTLY TRACK THIS INDICATOR IN THIS FORM?
>
> 2. DO YOU CONSIDER THIS INDICATOR IMPORTANT TO TRACK, NICE TO HAVE, OR UNNECESSARY TO TRACK ON A FORMAL BASIS?
>
> 3. IF THE INDICATOR IS IMPORTANT TO TRACK, ARE YOU SATISFIED WITH THE WAY IT IS WORDED?
>
> 4. DO DATA CURRENTLY EXIST TO CREATE THIS INDICATOR? IF SO, WHERE? IF NOT, HOW WILL THE DATA BE CAPTURED?
>
> 5. IS THE INDICATOR FEASIBLE TO TRACK? IN OTHER WORDS, IS THE BENEFIT OF THE DATA WORTH THE COST OF MEASURING?

THESE ARE THE QUESTIONS WE WILL CONSIDER. IF AN INDICATOR IS JUDGED AS NOT IMPORTANT OR NOT FEASIBLE, THEN IT WILL BE DELETED M THE INDICATOR SET. ARE YOU READY TO PROCEED? O.K. LOCK AT KRA NO. 1, INDICATOR NUMBER 1. DO YOU CURRENTLY TRACK THIS INDICATOR IN THIS FORM? (The facilitator proceeds in this fashion until all indicators have been considered.)

3.5.4 Documenting Results

Following the review session, the facilitator prepares a report of results. The report is given to the commander of the target unit. The facilitator should strongly recommend that information in the report be shared by the commander with all MGEEM participants, along with a statement of the commander's plan to use the indicators. Table 12 suggests a format for this report.

KRA 1: Mobility (Wartime Role): Be prepared to deploy with customers
       (SAC and MAC) to provide weather support, forecasting, and observing
       to flight crews and commanders at operating locations.

Five indicators, as follows:

(a) $\dfrac{\text{Number of components of mobility kit on hand (e.g., climatological, geographical, equipment)}}{\text{Number of components required for mobility}}$ Tabulate from Mobility Checklist

(b)   Number of kits per tasked area   Tabulate from Plans and Kits

(c) $\dfrac{\text{Number of items serviceable (per kit)}}{\text{Number of items in kit}}$ Tabulate from Plans and Kits

(d) $\dfrac{\text{Number of people who respond on time with all personal gear}}{\text{Total number of people on mobility}}$ Log Required

(e) $\dfrac{\text{Number of observations using TACMET equipment that verify with observations taken with standard equipment}}{\text{Number of observations with TACMET equipment}}$ Not Available

KRA 2: Observing weather events: Accurate and timely observation,
       recording, and dissemination of notices of weather events.

Four indicators, as follows:

(a) $\dfrac{\text{Number of observations by observer that agree with observations taken by station chief}}{\text{Number of observations compared}}$ Not Available

(b) $\dfrac{\text{Number of correct entries on Form 10}}{\text{Total number of entries}}$ Computer Report

(c)   Scores on tests of observing principles, determining proficiency, and familiarization with manuals and operating procedures and equipment   Not Available

(d) $\dfrac{\text{Number of local observations taken (electro-writer)}}{\text{Number of local observations required}}$ Tabulate from Electro-Writer Sheet

·
·
·
etc.

[a] Sources of data to form indicators shown in right column.

3.6 Pitfalls to Avoid

Experience in applying the MGEEM suggests the potential for a number of problems and mistakes to occur. If anticipated, however, they can be avoided. This section identifies these potential problems and mistakes and suggests ways to avoid them or deal with them.

3.6.1 Degree of Facilitator Influence

The MGEEM is a participative methodology in which the target organization defines KRAs and indicators that its members believe to be important. It is essential to remember that participation increases greatly the probability of acceptance and use of the resulting productivity measurement system by the target organization. It is therefore necessary that the facilitator not exert his/her will on the group since that tends to reduce the participants' sense of ownership of the KRAs and indicators.

The role of the facilitator is to use the MGEEM process to guide organizational participants toward consensus and high quality results. The facilitator plays that role best by ensuring that teams follow the prescribed procedures closely. With respect to the quality of the content, the facilitator's role is to raise questions about KRAs and indicators that may be weak. For example, a facilitator's comment with respect to an indicator could be as follows:

WHAT ARE WE REALLY MEASURING HERE? or WHAT ARE WE COUNTING IN THIS INDICATOR?

Such a remark could be helpful in guiding the group to look critically at an indicator. On the other hand, consider the following comment:

THIS INDICATOR IS REALLY WEAK; I THINK IT SHOULD SAY NUMBER OF HOURS WORKED.

Such a remark by the facilitator could be counterproductive even though it might be true. By imposing his/her opinion, the facilitator will cause the process to break down and will lose rapport with the team.

3.6.2 Handling Disruptive Team Members

The facilitator must build and maintain an atmosphere conducive to a free and open exchange of ideas; however, discipline must be maintained. Generally, the facilitator should confront disruptions in a courteous but direct manner. For example, if a side conversation is going on during the silent generation of answers process, the facilitator could say:

WE HAVE ONLY ABOUT 5 MINUTES LEFT, SO PLEASE ALLOW THOSE WHO ARE STILL WORKING TO WORK WITHOUT INTERRUPTION.

If conversation continues, the facilitator should speak to the offenders individually, asking them to refrain from disturbing the group.

A potentially troublesome issue is smoking during the sessions. To solve this problem, the facilitator can raise this issue with the group at the beginning of the session and seek consensus regarding smoking during the session. If the group is split on the issue, then the facilitator should say with a sense of humor, not in a confrontational manner:

SINCE WE CAN'T COME TO ANY AGREEMENT ON THIS ISSUE, PART OF MY JOB IS TO PLAY "BAD GUY." THEREFORE, I WOULD PREFER THAT THOSE OF YOU WHO SMOKE CONFINE YOUR SMOKING TO THE BREAKS. LET ME KNOW IF THAT CREATES ANY MAJOR PROBLEMS.

Such a comment, made politely, will normally put the issue to rest.

3.6.3 Creating the Proper Mental Set

Because the MGEEM is a consensus-seeking process, the facilitator should promote commonality among viewpoints in every possible way. One critical step in this direction is to make sure that everyone, throughout the process, approaches their task as though they were the commander of the target organization. If participants are allowed to maintain their own unique perspectives, particularly in the KRA process, this will create difficulties. For example, subordinate managers may be motivated to justify their existence in front of their boss by listing everything their people do. This will extend the process unnecessarily by focusing the group on items that are too "micro" in terms of organizational level. To avoid such problems, the facilitator must ask everyone to "wear the commander's hat" throughout the exercise and look at the "big picture."

3.6.4 Not Allowing the Discussion to Bog Down

A primary job of the facilitator is to keep the process moving, to set and maintain the pace. Normally, the problem here is that the group will get "hung-up" on some issue and spend too much time on one KRA or indicator. Frequently, this degenerates into a discussion between one or two team members who have special knowledge or interest in the item. When this happens, other team members become bored and want to move on. The facilitator must be able to "read the group" and determine when this is happening. A few skillfully worded comments will usually correct this problem. For example, if two people are emotionally debating a tangential issue, the facilitator might say:

THIS SEEMS LIKE AN ISSUE THAT WILL BE SETTLED BY OUR VOTING PROCESS. CAN WE MOVE ON?

On the other hand, suppose the group as a whole is debating an issue that the facilitator believes is so important that it could prevent the group from coming to consensus. Then a "prompting" designed to catalyze the discussion is appropriate. For instance, the facilitator could say:

YOU HAVE MADE A NUMBER OF POINTS; LET ME TRY TO SUMMARIZE THE DISCUSSION AND FRAME
THIS ISSUE. (State the issue as you perceive it.) IS THIS THE QUESTION BEFORE US?

If the facilitator perceives that the group is spending too much time on a subject, then he/she can call on someone who has been quiet during the debate and say:

JOE, YOU HAVEN'T SAID MUCH. WHAT DO YOU THINK ABOUT THIS?

The discussion can bog down in many ways. The facilitator must recognize that it is happening, try to determine why it is happening, and make a decision either to intervene in the discussion or to force the group to move on.

4. USE OF PRODUCTIVITY MEASURES AS A MANAGEMENT TOOL

This section discusses procedures for using the productivity measures which result from the MGEEM as a tool for improving organizational productivity. The facilitator's role is to help the organization develop and implement a system for tracking and reporting productivity measurement data, but not to make the process facilitator-dependent. In other words, the system must be simple enough that the organization can operate and maintain it without facilitator

assistance. However, as in implementing any new procedure, there is an initial "hump" to be overcome. The facilitator must help the organization overcome initial startup inertia and prepare the organization to assume ownership of the system.

The key elements of this role are operationalizing the indicators, developing a method and format for reporting measurement data, instructing management with respect to considerations in providing feedback, and suggesting ways to involve members of the organization in the use of the data as input to group problem-solving efforts (e.g., quality circles).

4.1   Obtaining Data from Formal and Informal Sources

Following their development and screening, indicators must be made operational by locating and accessing existing data or developing new data sources. Based on past experience with the MGEFM, it is likely that 70% to 90% of the indicators generated by a target organization will make use of existing data. These data may be in the existing information system or may exist in informal logs or reports maintained by the organization for its own use. The remaining 10% to 30% of the indicators will require new data-capturing procedures. This section focuses on guidelines for capturing data which already exist. Development of new data collection procedures is beyond the scope of this discussion.

4.1.1   Obtaining Data from Formal Data Sources

Air Force organizations routinely track and monitor a wide range of performance and financial indicators. In most cases, decisions about what should be tracked are made by higher head-quarters, often with field input, for management control purposes. Higher headquarters personnel design reporting procedures, forms, and computer software to input data, analyze data, and generate management reports. The data needed for management control purposes may be different from the data needed by a local commander for improvement purposes. The important implication of this difference is that data required by a local commander may exist in an automated system but may not be reported in the form that the unit commander needs. Thus, there are two sets of problems in obtaining data for the MGEEM from formal sources. One involves obtaining data from management information system products, and the other involves accessing data which may be input to a standard information system but which do not appear as standard output products.

In the first case, the facilitator's main concern is with the timeliness of the data. For example, if the indicator is "number of late report submissions/number of reports submitted," this data element may not be available from headquarters until at least a month later. That is, the data for September may not be returned to the local unit until October, meaning that the unit would get feedback only after 30 or more days' delay. On the other hand, the local unit could keep its own record of the number of reports submitted and the number late, and have these data within a few days after the end of the reporting period. The obvious tradeoff involved is the cost of keeping additional records versus the benefit of having timely data. The facilitator's role is to present the commander with this issue and point out the consequences of both courses of action. For example, the facilitator may have determined that it would take 6 hours of clerical work to complete the effort at the unit level versus 20 minutes to take the data off the standard report when it is received in 30 to 40 days. The locally generated data will have considerably more value as a management and motivational tool than data that are 30 to 40 days old. It is up to the commander to choose to generate the data locally or wait for the standard information system product.

When data are captured and reported to higher headquarters, but not reported in the form needed to create the local indicator, a different set of issues arise. For instance, assume that

the indicator is "average number of days for supply unit X to process an Article 15/average number of days for all supply units in the MAJCOM to process an Article 15." The local unit can track on its own the numerator of this indicator. However, the denominator requires data from a higher headquarters database. In order for the local unit to use this indicator, it will be necessary to obtain a special information system product that excerpts this information from the MAJCOM database. Depending on the unit commander's resourcefulness and "clout," this may or may not be feasible. Thus, the local commander is presented with a different set of choices. One choice is to attempt to have the data supplied by higher headquarters and accept the delay while a reporting system is modified. However, once modification is made to provide these data on a monthly basis, the data received in September may represent performance in July rather than August due to reporting delays. Therefore, after the effort has been made to get the data, the information may have limited utility because of its age.

The other choice is to modify the indicator so that it can be developed locally. For example, the indicator could be restated as "average number of days to process Article 15s this month/average number days to process Article 15s in the past 6 months." In this way, the unit is comparing its performance, not with other units in the command, but with its own past performance. Although this is different information, it is more controllable from the unit commander's viewpoint. The negative aspect is the effort required to generate the numbers locally. Again, the facilitator should discuss these tradeoffs with the local unit commander.

4.1.2 Obtaining Data from Informal Sources

Informal sources consist of data that are recorded on logs, locally developed forms, or other tracking systems that the local unit may have devised. Frequently, such records are maintained by the commander for protection against customer complaints, to document performance problems of the unit or individuals, etc. In some cases, records are maintained to assist the unit in improving performance. In any case, more information is usually captured than is tabulated and displayed in quantitative form or fed back to members of the organization. The problems facing the organization in this situation are specifying the data elements needed for the indicator, defining the coding procedures required to go from a log to a quantitative indicator, and allocating the resources to do the work. However, the advantage is that the local unit has complete control over the process.

4.1.3 Precise Specification of the Data-Indicator Relationship

Regardless of the source of data (i.e., formal or informal), it is necessary to define precisely the relationship between data elements in information systems or informal records and each indicator. The specification must contain the rules for translating data elements into indicators, the time periods involved, and the interpretation of the resulting indicator. The purpose of this activity is to specify the relationship unambiguously so that the data recording process can be performed consistently over time. Otherwise, the reliability and validity of the indicators will be seriously impaired. An example illustrating the correct use of this process is shown in Table 13.

For each indicator, the facilitator, with the assistance of appropriate unit personnel, must carefully specify the data-indicator relationships as illustrated in Table 13. In addition, the facilitator must assist the organization in capturing the data elements required to establish the baseline performance level for each indicator. The procedures required for each situation will vary. Thus, this discussion cannot describe these procedures in detail.

Table 13. Example of Data-Indicator Specification

KRA No. 1. Effectiveness, Legality, and Appropriateness of the Unit Reporting Process

1. Indicator: Most recent inspection rating

2. Specifications:

   (a) Data source - most recent published IG report

   (b) Numerical index computed as follows:

      6 = Outstanding
      5 = Excellent
      4 = Satisfactory
      2 = Marginal
      0 = Unsatisfactory

   (c) Time Period - Indicator changes with next IG or MEI inspection.

   (d) Interpretation - The higher the number, the better the performance.

4.2 Reporting the Data

To use productivity measurement data as a performance improvement tool, a suitable reporting format must be selected. This section describes two such formats. The first is the Objectives Matrix (Felix & Riggs, 1983), and the second is line graphs. The Objectives Matrix provides a means of reporting changes in (a) individual performance measures and (b) total organizational performance based on the sum of all individual performance measures. The line graph is by far the simpler of the two methods, but depicts only changes in individual performance measures. The two methods can be used separately or in combination. For example, line graphs can be developed for each individual performance measure and the Objectives Matrix can be used to create an overall performance index. Another format for using productivity measurement data as a management tool, the product-to-contingencies technique, is under preparation by the Air Force Human Resources Laboratory (AFHRL).

4.2.1 Developing the Objectives Matrix

This section describes the steps in constructing an Objectives Matrix and explains how to use it. The example in Figure 7 illustrates the use of an Objectives Matrix with one KRA which has five indicators. If an organization had generated five KRAs, each with a number of indicators, it would be necessary to construct five separate matrices similar to the one shown in Figure 7. However, if the commander concludes that constructing five matrices requires too much effort, he/she may decide to select one indicator for each of the five KRAs and construct only one matrix. In such a case, line 2 in Figure 7 would be KRA titles instead of indicator titles. Line 3 would be five indicators, one for each of the five KRAs. The Objectives Matrix is a flexible reporting procedure which can be expanded or contracted merely by adding or subtracting columns as required to fit the number of indicators.

1 KRA No. 1 <u>Adequate No. Engines to Meet Mission Requirements</u>

	1	2	3	4	5
2 Indicator title	Abort	Delay	N.O.R.S.	Quality	Impact
3 Indicators	# takeoff aborts / # takeoffs	Avg. time between writeup and repair completed	Not operational for supply rate	# Repeat repairs T2 / # reports T1	No. hours engine stays on wing
4 Measurements (current period)	.03	18 hrs.	.09	.87	100	

5 Performance Level						
	.01	13	.01	1.00	100	10 (1-2 yr. goal)
	.02	14	.02	.9	90	9
	.03	15	.04	.8	80	8
	.05	16	.09	.7	70	7
	.10	17	.15	.6	60	6
	.16	18	.25	.5	50	5
	.24	19	.35	.4	40	4
	.35	20	.45	.3	30	3 (baseline)
	.48	21	.55	.2	20	2
	.60	22	.65	.1	10	1
	Over .75	23+	.70+	0	0	0 (worst)

	Abort	Delay	N.O.R.S.	Quality	Impact	
6 Current period equivalent score	8	5	7	8	10	
7 Manager's weight	30	20	20	20	10	
8 Equivalent score x weight	240	100	140	160	100	KRA Score = 740

Figure 7. Objectives Matrix.

4.2.1.1 List Indicator/KRA Titles. The first step in using the Objectives Matrix is to fill in the indicator titles. This is line 2 in Figure 7. The KRA and the indicators would, of course, be products of an MGEEM process.

4.2.1.2 Define Indicators. Next, the formulas used to create the indicators are presented on line 3.

4.2.1.3 Define Performance Levels for Indicators. The next step is to define performance levels for each indicator (Line 5). This step provides a means of transforming measures on the indicators to a common scale. The common performance scale is shown on the extreme right side of the matrix on line 5. The scale ranges from 0 (the worst possible) to 10 (1- to 2-year goal). Corresponding performance scales for each indicator are entered on line 5. These scales are developed as follows:

1. Define the baseline for each indicator. If an indicator, as measured by the formula in its column on line 3, is already in use by the unit, the baseline performance level can be established from historical data. As a rule-of-thumb, 3 months of historical data should suffice. However, if there are strong cyclical or seasonal variations in the performance measured by the indicator, then data over a longer time period may be required to establish a stable baseline. On the other hand, if the performance measured by the indicator varies relatively little, then 1 to 2 months of data may be sufficient. The baseline normally is the arithmetic mean (average) of the 3 months' historical performance. If no historical data are available, then the indicator must be tracked for some period of time (e.g., 1 to 3 months) in order to establish the baseline. Once the baseline for an indicator is determined, this number is written on the Objectives Matrix under the column for the appropriate indicator and at the appropriate performance level (line 5) corresponding to a certain point on the 0 (worst) to 10 (1- to 2-year goal) common performance scale. If one assumes that 0 on the 0 to 10 scale represents the lowest conceivable level of performance for this unit and 10 represents a goal aspired to in 1 to 2 years, then current performance is the baseline. The rule-of-thumb is to establish current performance at Level 3 on the common performance scale. For instance, if .35 is the baseline for indicator 1, Abort (computed by number of takeoff aborts/number takeoffs), it would be written under column 1 on line 5 to correspond to 3 (baseline) on the scale. That is, the .35 would be written in column 1 on the same row as 3 (baseline) on the 0 to 10 common performance scale (see Figure 7).

2. Establish performance levels for each indicator to correspond to 0 and 10 on the common performance scale. After baselines are set for each indicator, the next step is to define performance levels 0 and 10 for each indicator. Level 0 is the level of performance envisioned as the worst that reasonably might occur within this unit on the indicator in question. Establish the number and write it in the appropriate indicator column on the same line as 0 in the performance scale at the extreme right. For instance, in Figure 7 this value is "Over .75" for Indicator 1, Abort, so Over .75 appears on the bottom row on line 5 to correspond with 0 (worst) on the 0 to 10 common performance scale. Repeat this step for Level 10. Level 10 is a challenging goal that could be reached if improvement were continued for 1 to 2 years. The selected time period should correspond to the planning horizon of the organization. Write this number in the appropriate indicator column on the same line as 10 in the performance scale at the right. For instance, in Figure 7 this value is ".01" for Indicator 1, Abort, so .01 appears on the row on line 5 to correspond with 10 (1- to 2-year goal) on the 0 to 10 common performance scale.

3. Fill in the remaining values. Now that Level 0, baseline Level 3, and Level 10 have been determined for each indicator, the remaining indicator performance levels can be added. The simplest way to do this is to establish equal intervals between the baseline and Level 10 and

37

between the baseline and Level 0. This assumes that it is equally difficult to move up the scale from one level to the next. If it is believed that moving up the scale gets progressively more difficult as one moves to the top, the increments can be made larger at lower levels and progressively smaller nearer the top of the scale. The performance scale for Indicator 1, Abort, in Figure 7 illustrates a scale with unequal intervals.

4.2.1.4 Establish Manager's Weights. The next step involves establishing weights for individual indicators (see Figure 7, line 7, labelled "Manager's weight"). In establishing an overall score (the sum of performance levels on all indicators) for a KRA, it is likely that indicators are not equally important in terms of their individual contributions to mission accomplishment. Therefore, indicators can be differentially weighted to reflect their varying importance. This weighting process is accomplished by dividing 100 points among the indicators. In Figure 7, 100 points are allocated on line 7 to the five indicators. Indicator 1, Abort, received 30 points; Indicator 2, Delay, received 20 points; Indicator 3, N.O.R.S., received 20 points; and so on. This distribution can be made by the unit commander, a manager, or a group. The group would involve the entire management team and has the benefit of assuring a similar understanding among team members of the relative priorities of indicators.

4.2.2 Using the Objectives Matrix

Once the above steps are completed, the Objectives Matrix is ready for use. Before its use, however, the period of performance tracking must be defined. Normally this will be monthly. In any case, using the Objectives Matrix involves the following steps.

4.2.2.1 Obtain Measurements for the Current Period. Measurements of performance on each indicator for the current month are written on line 4, labelled "Measurements (current period)." In Figure 7, for the month under consideration, the result of the computation of the formula shown in line 3 for Indicator 1, Abort, was .03. This value was placed under Abort on line 4.

4.2.2.2 Obtain Current Period Score. The current period measurement of a given indicator (shown on line 4) is located on the performance scale (shown on line 5) and then compared with the 0 to 10 common performance scale at the extreme right. In Figure 7, the current period measurement for Aborts of .03 on line 4 is located on line 5 and corresponds to Level 8 on the 0 to 10 common performance scale at the extreme right. Therefore, an 8 is written on line 6, labelled "Current period equivalent score," in the Abort column. For the second indicator, Delay, the current period measure, 18 hours, shown on line 4 is located on the performance scale (line 5). The performance level of 18 for Delay translates as Level 5 on the 0 to 10 common performance scale at the extreme right. Therefore, a 5 is written on line 6, "Current period equivalent score," in the Delay column. This process is repeated for all indicators to fill out all values in row 6. It should be emphasized that each higher level of performance to be achieved should be treated as a hurdle.

4.2.2.3 Obtain Weighted Score. The "Current period equivalent score," line 6, is then multiplied by the value in line 7, "Manager's weight," to obtain the "Equivalent score x weight" value shown on the bottom line, line 8, as shown in Figure 7. For instance, the "Current period equivalent score" for Aborts on line 6 (which is 8) multiplied by the corresponding "Manager's weight" of 30 on line 7 yields an "Equivalent score x weight" value of 240 on line 8. Finally, the overall score for this KRA, 740, is obtained by summing the "Equivalent score x weight" values for all indicators (all values on line 8). This sum, 740, (240+100+140+160+100) is the total KRA or organizational performance score for the current period.

4.2.2.4 Use the KRA Score to Assess Performance Improvement. Absolute scores do not tell unit commanders or unit members much about their performance. It is more useful to compare

current performance with some measure of performance in the past. Typically, organizations compute monthly comparisons between present performance and a baseline. Such computation may be made as follows:

Assuming a baseline performance score of 710 and a current period performance score of 740, the current period performance index would be computed as follows:

Performance Index = Current Period Performance Score - Baseline
$$\text{Performance Index} = \frac{\text{Current Period Performance Score} - \text{Baseline Performance Score}}{\text{Baseline Performance Score}} \times 100$$

$$\text{Performance Index} = \frac{740 - 710}{710} \times 100$$

$$= 4.2$$

This indicates that productivity increased 4.2% from the baseline (710) to the current period (740). Similar indices can be computed from the previous month or any other period of interest. Normally, current versus baseline and current versus previous month are the primary indices of interest.

4.2.3. Developing Line Graphs

A second method of reporting results of productivity or performance measures is the line graph. The line graph provides a pictorial representation of performance changes over time. Often, they are plotted with respect to a goal or target level of performance. As illustrated in Figure 8, the line graph requires the definition of a time period for the horizontal axis and performance levels for the vertical axis. The addition of a baseline and goal are optional, but useful. Once constructed, the line graph requires little maintenance other than plotting data for each month.
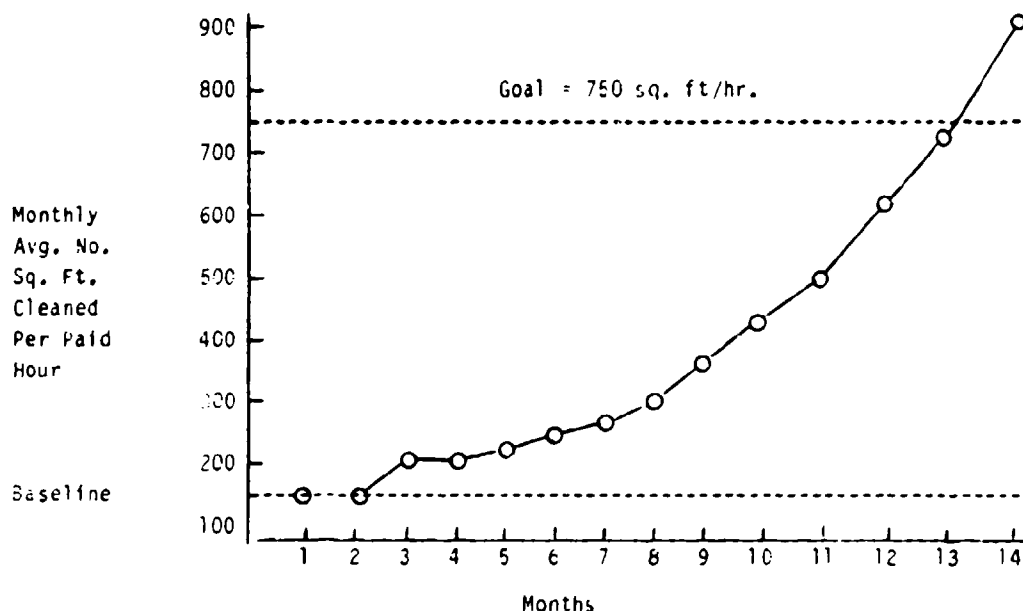

Figure 8. Example of Line Graph.

4.2.4 Using Line Graphs

Line graphs can be used with the Objectives Matrix to portray performance on each indicator and/or overall performance. It is not recommended that a line graph be used to portray a single performance/productivity indicator because it could focus the attention of the organization on one aspect of performance to the exclusion of others. As a consequence, the measurement of overall performance may be distorted. This potential problem is illustrated by the line graph in Figure 8. Suppose this graph were displayed in a maintenance area to provide feedback to the maintenance staff. It suggests that management wants to increase the number of square feet of space cleaned per paid work hour. Obviously, there are many ways that employees can make the measure increase. One way is to reduce time spent providing quality service to customers so that more time could be devoted to cleaning. Therefore, unless management also provides a line graph displaying quality, the use of the graph in Figure 8 could be harmful. Displaying a graph sends a clear signal to members of the organization about what performance is desired. Therefore, the commander must ensure that the right message is sent.

4.3 Considerations in Providing Feedback

As stated earlier, feedback is a powerful tool for improving performance. AFHRL has supported an extensive research program to identify practical guidelines for the use of feedback by Air Force organizations to improve and sustain performance and productivity. This section briefly summarizes significant lessons learned from this research. For more detail, see Pritchard, Bigby, Beiting, Coverdale, and Morgan (1981). A manual on the use of feedback in operational Air Force environments is under preparation for AFHRL.

4.3.1 What Should Be Fed Back?

Measurement information contained in a feedback report should cover all important aspects of work. It should contain individual performance measures, as well as total performance based on the sum of individual performance measures. It should provide quantitative information on performance for the period, and it should also specify "how good" that level of performance is in a qualitative sense. Finally, as previously discussed, indicator data should be confined to information on dimensions of performance that are under the control of the target organization.

4.3.2 What Should Be the Source of Feedback?

The feedback report should derive from the productivity measurement system developed by the MGEEM. It should be produced in hard-copy form (e.g., computer report) and be perceived as coming from the supervisor or unit commander.

4.3.3 What Form Should the Feedback Take?

Feedback reports for groups should be publicized. This may be achieved by giving reports to all organization members and/or by posting the data in a conspicuous place where all organization members can frequently view the results. The frequency of feedback depends on the nature of the work processes on which the measurement data are based. A rule-of-thumb is to give feedback as frequently as the work cycle time permits. The feedback report should indicate how the current period of performance compares with a previous period so that members of the organization can see changes. The Objectives Matrix (Figure 7), combined with line graph feedback (Figure 5),

satisfies these requirements. Another procedure which satisfies these requirements, called the product-to-contingenices technique, is under preparation for AFHRL.

4.4 Linking Measurement to Group Problem Solving

Many Air Force organizations involve organization members in problem-solving activities, such as quality circles, task teams, and labor-management committees. Such groups differ as to how they select the problems they will address. For instance, quality circles members are typically free to make that determination on their own. The commander may suggest a problem, but members are free to accept or reject the recommendations of the boss. In other arrangements, task teams are formed to work on a defined problem or issue.

Whether management or teams select problems, it is often helpful to have a mechanism that provides quantitative information on performance. The MGEEM fulfills this need. In the MGEEM process, the organization defines its mission in terms of KRAs and indicators that cover the important facets of performance. In those instances where the Objectives Matrix and/or line graphs reveal trends in performance that may not be in the desired direction, these trends can be investigated by problem-solving teams. Once a team has analyzed the problem and recommended and implemented a solution, MGEEM data can be of further use in evaluating the effectiveness of the implementation of the team's suggested intervention.

Most employee involvement efforts have three areas of potential weakness. First, persons involved in such efforts worry about whether the problems they select for study will help the organization. Second, management support for employee involvement efforts is often difficult to obtain and maintain. Third, groups involved in such efforts experience a strong need to demonstrate that their efforts pay off for the organization. These questions are effectively addressed by use of the MGEEM.

4.5 Pitfalls to Avoid

As is the case with any performance improvement strategy, there are potential dangers and problems associated with use of the MGEEM. These can be avoided through judicious use of the technique. This section draws from the authors' experience with the MGEEM and from recent research on goal setting (Locke & Latham, 1984) to address these potential dangers and problems.

4.5.1 Fear of Being Measured

Individuals often express concerns about the measurement of their performance, but these concerns can be ameliorated. One concern, fear of failure, can be dealt with by encouraging groups to set goals that are challenging but attainable. Another concern is fear of repercussions from higher headquarters. This is often grounded in a past history of having been "called on the carpet" by a superior for a performance problem, inspection report, customer complaint, etc. The facilitator can reduce this fear through the design of the MGEEM procedure and the reporting process. The following steps are involved. First, including the higher-level commander in the KRA development process will break down barriers and increase understanding up the line. Second, reports submitted up the line should be summary reports that do not provide detailed information on each indicator tracked. This will reduce the potential for "micro-management" from above. For example, an agreement could be struck with the next higher-level commander that regular reports submitted will include only the aggregate performance index generated from the Objectives Matrix. This will provide a degree of insulation for the lower-level commander, but still ensure accountability for results.

41

4.5.2 Goals as Ceilings

Goals are intended to serve as targets that encourage performance improvement. However, goals can operate as ceilings which discourage further effort once a target is reached. The key to avoiding ceiling effects is to establish in the organization an "ethic" of continual performance improvement. That is, regardless of the level of performance attained, there is an understanding that there is a need to make further improvements. However, unless this rationale is supported by rewards and reinforcers for excellent performance, the ethic will not be sustained. In most Air Force organizations, there is an ethic of high performance. Nevertheless, commanders must be continually alert to find new ways to recognize and reward members of the organization for high performance to sustain this ethic. The MGEEM can be helpful in sustaining such an ethic because it can be used to set up a situation in which the organization competes with itself over time. This is healthy if reinforced by the commander and can help overcome ceiling effects associated with goals. Through competition, goals can be raised. In addition, the Objectives Matrix provides a means of combining short-term goals with a longer-term focus by having intermediate hurdles along the way to a 1- to 2-year goal. A manual that includes a menu of incentives and forms of recognition, together with measures of their attractiveness to enlisted Air Force personnel, is in preparation for AFHRL. This document is designed for use by commanders, managers, and supervisors to provide rewards and reinforcers to help sustain a performance improvement ethic.

4.5.3 Non-Goal Measures

"What you measure is what you get." Because this is true, commanders need to ensure that only important facets of organizational performance are measured. The MGEEM guarantees this by forcing the indicator development process to take place in relation to KRAs. Therefore, with the MGEEM, it is impossible for the organization to develop a set of indicators that are easy to measure but which miss the most important performance areas.

4.5.4 Gaming the System

As with any measurement system there is the potential for "gaming." People are creative with respect to "giving the boss what he/she wants to see." Controls for this tendency must attack the motivation to "fake" rather than attempt to make the system fakeproof. That is, the facilitator should concentrate on developing the participants' motivation to create a good system. Much of what has been said above deals with this issue. For instance, reducing the fear of higher headquarters intervention, involving the organization in the development of the measurement system, and creating an ethic of continual performance improvement are all efforts to reduce the motivation to "game the system." There is no desire to game a system that members of the organization feel truly belongs to them. If the MGEEM process is properly carried out, successful implementation of the system is assured.

42

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Format for Interview with Unit Commander

- -

Note to Interviewer

    Following introductions and preliminary discussion to establish rapport, the following questions may be used to gather information. These are simply opening questions and should be followed by "probes" to obtain more detail. Examples of probes are: "Tell me more about that." "Could you elaborate?" "Could you give me a specific example?"

    The purpose of the interview is to make possible the construction of a systems diagram of the organization. It is helpful to visualize this diagram as the interview is conducted.

- -

   1. What is the mission of this unit?

   2. What are the major products/services of the unit?

   3. Who are the principal customers of the organization?

   4. What about staffing levels? How many military and civilian personnel are authorized? Assigned? What is the breakdown by grade level and experience?

   5. What other units does this organization depend upon for information or support in order to get the job done?

   6. What degree of control do you, as commander, have over:

      number of personnel hours?
      material and equipment acquisition?
      capital investment?
      energy consumption?

   7. How is this unit evaluated by higher headquarters?

   8. What primary indicators do you use to tell you that the unit is doing what it is supposed to do?

   9. Do you have a standard in-briefing for visitors? If so, could I have a copy of your briefing slides? What other written material would help me better understand your mission and organizational structure?

   10. What else should I know?

APPENDIX B: MEASUREMENT IMPLEMENTATION PLAN FORMAT

1. Purpose of Measurement Effort _____

_____

_____

2. Definition of Productivity for this Organization _____

_____

_____

3. Specification of the Target Organization (What's included and what's not)

_____

_____

4. Force Field Analysis Summary:

    a. Forces For: _____

                  _____

                  _____

    b. Forces Against: _____

                   _____

                   _____

                   _____

5. Strategies to:

    a. Increase forces for: _____

_____

    b. Decrease forces against: _____

_____

_____

6. Implementation Steps

| | Key Dates | | |
Step	Start	Review	Person Responsible
1. _____	___	___	_____
2. _____	___	___	_____
:	:		
:	:		
N _____	___		_____

7. Communication Activities

Activity	Start Date	Person Responsible
1. _____	___	_____
2. _____	___	_____
:	:	
:	:	
N		

8. Coordination/Liaison Requirements _____

_____

Propulsion Organization 5

Key Result Areas, Indicators and Data Sources

KRA 1: <u>Sufficient number and quality of J-57 engines to meet mission requirements</u>

1-1. $\dfrac{\text{Number of operable spare engines}}{\text{Total engines on hand in shop}}$ AF Form 1534, engine management system

1-2. $\dfrac{\text{Number of test cell rejects}}{\text{Number of engines tested}}$ AF Form 1534, engine management system

1-3. $\dfrac{\text{Number of premature removals within 100 hours (Time x+1)}}{\text{Number of premature removals within 100 hours (Time x)}}$ AF Form 1534, engine management system

1-4. $\dfrac{\text{Number of repair actions on wing within 100 hours (Time x+1)}}{\text{Number of repair actions on wing within 100 hours (Time x)}}$ Base level information system (BLIS)

1-5. $\dfrac{\text{Number of 3-levels assigned}}{\text{Total branch manning}}$ Local training form
Unit Manning Document

1-6. $\dfrac{\text{Actual man-hours available}}{\text{Man-hours assigned}}$ AFTO Form 349, Monthly Maintenance Summary

1-7. $\dfrac{\text{Number of failed personnel and technical evaluations}}{\text{Number of evaluations}}$ AF Form 2419, Routing and Review of Quality Control Reports

KRA 2: <u>Ensure morale and well-being of personnel</u>

2-1. $\dfrac{\text{Frequency people recognized (Time x+1)}}{\text{Frequency people recognized (Time x)}}$ Not available

2-2. $\dfrac{\text{Number of defects detected on the job (Time x+1)}}{\text{Number of defects detected on the job (Time x)}}$ QC reports and maintenance standard evaluation team (MSET) report

2-3. $\dfrac{\text{Number people late for work (Time x-1)}}{\text{Number people late (Time x)}}$ Roll call books

2-4. $\dfrac{\text{Number of disciplinary actions (Time x+1)}}{\text{Number of disciplinary actions (Time x)}}$ Unfavorable information file (UIF) and consolidated base personnel office (CPO) personnel file

2-5. $\dfrac{\text{Hours of compensation time}}{\text{Hours of overtime}}$ Locally maintained record

2-6. $\dfrac{\text{Number of requests for change of duty section (Time x+1)}}{\text{Number of requests for change of duty section (Time x)}}$ Locally maintained record

2-7. $\dfrac{\text{By section, Number of counseling slips (Time x+1)}}{\text{Number of counseling slips (Time x)}}$ Locally maintained record

KRA 3: Proper assignment of personnel

3-1. $\dfrac{\text{By section, Number of qualified people available}}{\text{Number of people assigned}}$ AF Form 623, On-the-Job Training Record

3-2. By section, percent of 3-, 5-, and 7-levels assigned   Locally maintained record

3-3. $\dfrac{\text{By section, Total number of people assigned}}{\text{Total authorizations}}$ Locally maintained record

3-4 $\dfrac{\text{By section, average man-hours worked}}{\text{Expected man-hours available}}$ AFTC Form 349, Monthly Maintenance Summary

3-5. $\dfrac{\text{Number of personnel turnovers}}{\text{Number of personnel turnovers}}$ Locally maintained record

KRA 4: Safety of personnel

4-1. $\dfrac{\text{Number of safety-related incidents (Time x+1)}}{\text{Number of safety-related incidents (Time x)}}$ Q.C. record, safety office record

4-2. $\dfrac{\text{Number of detected safety violations (Time x+1)}}{\text{Number of DSV (Time x)}}$ Q.C. reports

4-3. Hours lost per month because of accidents   Wing Safety office record

4-4. $\dfrac{\text{Number of times protective apparel not worn when required (Time x+1)}}{\text{Number of times protective apparel not worn when required (Time x)}}$ Locally maintained record

KRA 5: Proper tools and test equipment and facility

5-1. $\dfrac{\text{Number of appropriate Q.C. and MSET writeups (Time x+1)}}{\text{Number of appropriate Q.C. and MSET writeups (Time x)}}$ Q.C. and MSET reports

5-2. $\dfrac{\text{Number of tools on backorder (Time x+1)}}{\text{Number of tools on backorder (Time x)}}$ AF Form 601, Equipment Action Request

5-3. $\dfrac{\text{Number of proper tool self-inspections (Time x+1)}}{\text{Number of proper tool self-inspection (Time x)}}$ Locally maintained record

5-4. Number of not repairable this station (NRTS) code 4 (Time x+1)   AFTO Form 349
      Number of not repairable this station (NRTS) Code 4 (Time x)

KRA 6: Proper conduct and discipline of personnel

6-1. Average number of counseling sessions before disciplinary   Locally maintained
      action   record

6-2.* Number of disciplinary actions (Time x+1)   MPF and CBPO
       Number of disciplinary actions (Time x)   personnel file

6-3. Number of on-base incidents (Time x+1)   Air police record

------

*See 2 - 4.

APPENDIX D: KRA DEVELOPMENT SESSION BRIEFING AND AGENDA

0800   Introduction

        Introduction of Facilitator and Participants
        Purpose of the Measurement Activity (Unit Commander)
        Overview of MGEEM Process
        Perspectives on Defining Measures (Slide 1)
        What are Key Result Areas? (Slide 2)
        Purpose of This Meeting
        Questions

0830   Productivity Overview

        Discussion of Organization Diagram (Slide 3 is sample - should use diagram for the target
        organization)
        Definition of Productivity for the Target Organization
        Questions

0900   Nominal Group Technique - Round 1

        Statement of NGT Question
        State That Frame of Reference is That of Unit Commander
        Silent Generation of Answers
        Round-Robin Listing
        Discussion and Clarification
        Vote 1

1030   Break (Results of Vote 1 are tallied during break)

1045   NGT Task - Round 2

        Discussion of Voting Pattern
        Modification of Items
        Vote 2

1130   Tally Vote 2 (Adjourn if sufficient agreement is obtained; otherwise, repeat the Round 2
        process. Upon adjournment, establish time for followup "reasonability check" meeting).

DEFINING MEASURES - PERSPECTIVES

- MEASUREMENT IS NOT AN END IN ITSELF

- WHAT YOU MEASURE IS WHAT YOU GET

- MEASUREMENT SYSTEMS FAIL IF THEY LACK ACCEPTANCE

- MEASUREMENT IS SUBSTITUTE FOR DIRECT OBSERVATION

- MEASUREMENT DATA HAVE THEIR LIMITATIONS

- MOST ORGANIZATIONAL UNITS CAN BE MEASURED

KEY RESULT AREAS

- AREAS IN WHICH A MANAGER MUST ACHIEVE HIGH LEVEL OF PERFORMANCE TO SUCCEED

- WAYS TO BREAK UNIT'S MISSION INTO PARTS AMENABLE TO MEASUREMENT

- THE CRITICAL, MAKE-OR-BREAK AREAS OF A JOB

- RESULTS, NOT ACTIVITIES, PROCESS, PROCEDURES OR TOOLS

- OUTPUT, NOT INPUT

- ENDS, NOT MEANS

- WHAT, NOT HOW
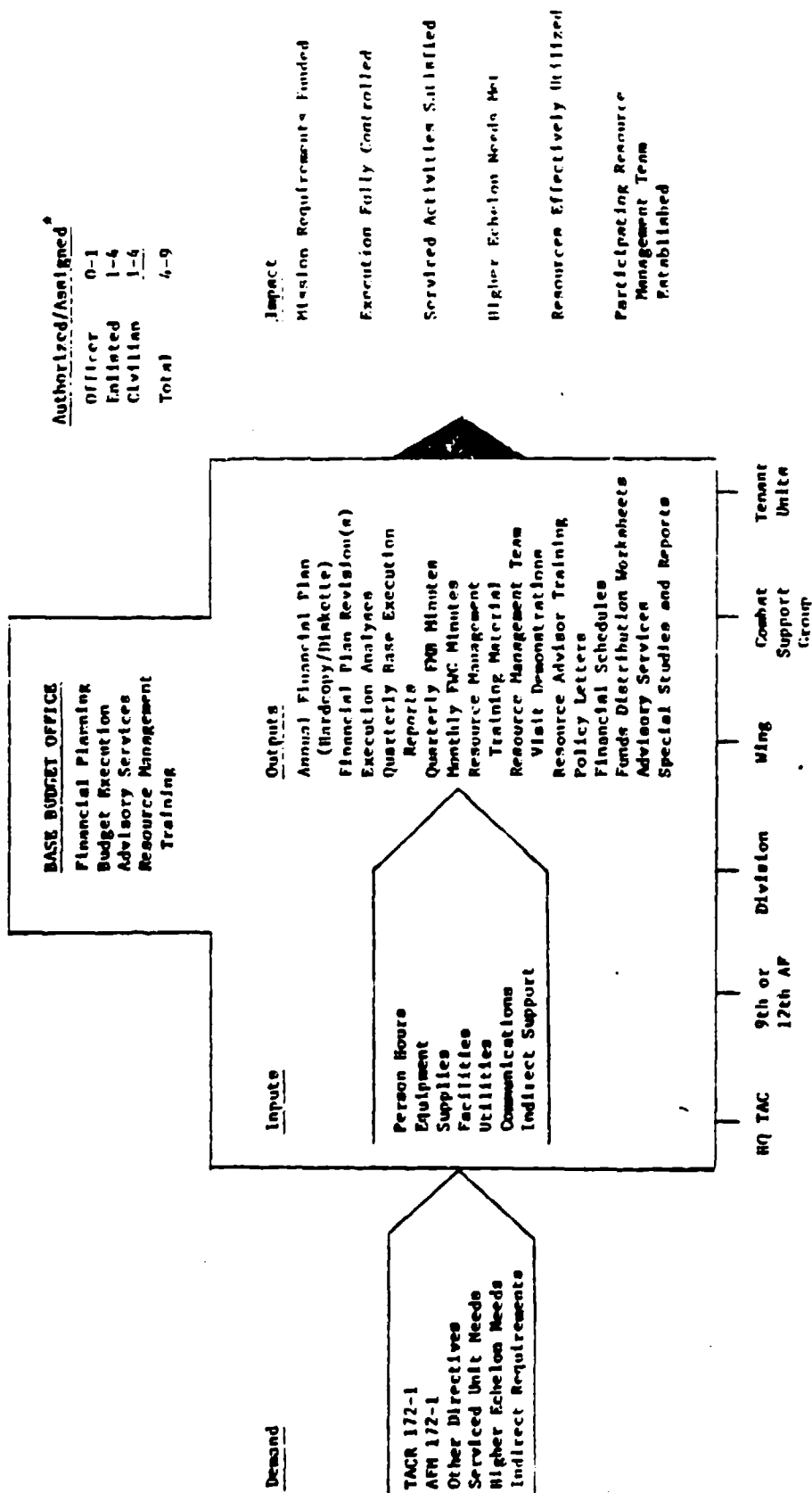
Authorized/Assigned*

Officer	0-1
Enlisted	1-4
Civilian	1-4
Total	4-9

Impact

Mission Requirements Funded

Execution Fully Controlled

Serviced Activities Satisfied

Higher Echelon Needs Met

Resources Effectively Utilized

Participating Resource
Management Team
Established

BASE BUDGET OFFICE

Financial Planning
Budget Execution
Advisory Services
Resource Management
Training

Outputs

Annual Financial Plan
(Hardcopy/Diskette)
Financial Plan Revision(s)
Execution Analyses
Quarterly Base Execution
Reports
Quarterly FWG Minutes
Monthly FWC Minutes
Resource Management
Training Material
Resource Management Team
Visit Demonstrations
Resource Advisor Training
Policy Letters
Financial Schedules
Funds Distribution Worksheets
Advisory Services
Special Studies and Reports

Inputs

Person Hours
Equipment
Supplies
Facilities
Utilities
Communications
Indirect Support

HQ TAC	9th or 12th AF	Division	Wing	Combat Support Group	Tenant Units

External Interactions

Demand

TACR 172-1
AFM 172-1
Other Directives
Serviced Unit Needs
Higher Echelon Needs
Indirect Requirements

ORGANIZATION DIAGRAM

*Range: All TAC bases as of 20 December 1983.

53

Date _____

APPENDIX E. KRA DEVELOPMENT WORKSHEET

Key Result Areas

Vote 1

Item No.	Voting Pattern	Tally	Ranking
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			

key Result Areas

Vote 2

Item No.	Voting Pattern	Tally	Ranking
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			

_____

_____

Final key Result Areas

Rank	Vote	Original KRA No.	Item Description
1			
2			
3			
4			
5			
6			
7			
8			

APPENDIX F: AGENDA AND BRIEFING FOR INDICATOR DEVELOPMENT SESSION

0800   Introduction and Overview

        Purpose of the Measurement Activity (Unit commander)
        Presentation and Discussion of KRAs Developed by Team A
        Task for Team B
        Questions

0830   Basic Considerations in Indicator Development

        Definition of Productivity for the Target Organization
        Desirable Indicator Characteristics (Slide 1)
        Examples of Performance Indicators (Slide 2)
        Examples of Measures (Slide 3)
        Indicator Development Quiz (Appendix G)

0900   NGT Process

        Ground Rules for Nominal Group Technique
        Round 1 -- KRA No. 1 (if group decides to start with KRA 1. The first KRA selected
        should be the one that is easiest to measure).

1015   Break

1030   (Continue until indicators have been generated for all KRAs. Typically, the process
        takes 60 to 90 minutes per KRA).

DESIRABLE INDICATOR CHARACTERISTICS

- COVER IMPORTANT MISSION FACETS

- UNDERSTANDABLE (SPECIFIC RATHER THAN ABSTRACT MEASURES)

- DERIVED WITH MINIMAL EFFORT FROM DATA ALREADY AVAILABLE AND/OR REPORTED

- COMPARABLE ACROSS WORK CENTERS

- CONTROLLABLE BY THE WORK CENTER

- ADDRESS EFFICIENCY AS WELL AS EFFECTIVENESS

- PROVIDE A REASONABLE DISPERSION OF VALUES

- USEFUL TO THE MANAGER

PERFORMANCE INDICATORS

GENERAL EXAMPLES

TYPES

● EFFICIENCY MEASURES

$$\frac{OUTPUT}{INPUT}$$ <u>PRODUCTS DELIVERED (OR CUSTOMERS SERVED)</u>
ASSOCIATED COSTS OR PERSON HOURS

$$\frac{ACTUAL}{STANDARD}$$ <u>RESULTS (OR ACHIEVEMENT RATE) FOR THE PERIOD</u>
EXPECTED RESULTS OR RATE

● EFFECTIVENESS MEASURES

GOALS MET   <u>RESULTS</u>
PAST RESULTS OR GOAL

QUALITY   <u>ERRORS, REWORKS, SUCCESSESS, ACCOMPLISHMENTS, ETC.</u>
EXPOSURES OR ATTEMPTS UNDERTAKEN

IMPACT   <u>EFFECT ON INTERNAL ORGANIZATION OR CLIENTS SERVED</u>
PAST IMPACTS OR GOALS

APPENDIX G: INDICATOR DEVELOPMENT QUIZ

1. Which one of the following phrases would be an acceptable output indicator?

    a. Pull engines

    b. Hours worked

    c. Number of engines r led per month

2. Which of the following . cators measure possible efficiency? (Choose one or more.)

    a. Number of inspections conducted this period
       Number of hours spent on inspections

    b. Number of quality control errors detected this period
       Number of products produced this period

    c. Actual expenditures this period
       Planned expenditures this period

    d. Actual number of engines repaired per shift
       Standard number of engines repaired per shift

    e. Average time between repairs

    f. Percent of total work hours vehicle is available for use

    g. Number of dollars damage to base property due to unforecasted severe weather

    h. First-term reenlistment rate for unit
       First-term reenlistment rate for base

3. In item 2, above, which indicators are effectiveness indicators?

4. Which indicator below is controllable from the point of view of a maintenance branch?

    a. Number of people authorized

    b. Average number of months in AFSC per person assigned

    c. Average number of hours to overhaul an engine

1. Alternative "c" is the answer. Alternative "a" simply describes a task and, as stated, is not quantifiable. Alternative "b" does not clearly specify what is to be measured; i.e., number of hours worked per employee per month.

2. Alternatives "a," "d," and "f" are efficiency indicators; "a" is an output/input ratio; "d" is a comparison between actual and standard performance; and "f" measures utilization.

3. In item 2, alternatives "b," "c," "g," and "h" are effectiveness indicators; "b" is a measure of quality; "c" is a measure of performance in relation to budgeted goal; "g" is a measure of the external impact on the unit itself. Obviously "h" is not a pure measure of internal impact since reenlistment rate is affected by other influences besides the way the unit is managed. Nevertheless, this indicator is partially controllable from the unit's point of view, which makes alternative "h" a crude, but perhaps acceptable, indicator.

4. Alternative "c" is correct. The unit, through its work activity, can impact the number of hours required to overhaul an engine. However, it has no direct control over the number of people authorized, alternative "a," or the experience level of the personnel assigned, alternative "b." These factors are controlled by the Air Force manpower and assignment processes and do not reflect the actions of an individual organization.

APPENDIX H: INDICATOR DEVELOPMENT WORKSHEET

As a base food services manager, what indicators should you use on a periodic basis to tell you if the Key Result Area is being accomplished?

Efficiency Indicators

Effectiveness Indicators

Indicator # _____

Importance As Indicated To Management

Currently tracked in this form ____ No ____ Yes _____→

1. Very Important / Must Track

Is wording of indicator O.K.? ____ No ____ Yes _____→

2. Nice to Have / Not Critical

Modification

3. Not Important / Unnecessary to Track

To 4

4. Data Availability ____ Yes ──→ Where?

_____ Numerator

____ No ──→ Feasible to Collect? ____ Yes ___ No

_____ Denominator